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tury, he might have met Erasmus without startling him as he startled the stranger of our day who saw him for the first time in the streets of Rome or in his studio on the Esquiline.

He was so gentle and kindly that all felt drawn towards him, while at the same time his reverend aspect inspired those who approached him with veneration. The purity of his life was reflected in his person, as in his art, and the atmosphere which surrounded him was so far removed from the tumultuous rush of modern existence, that when you left him, and plunged again into the world as it is, you carried away a thousand longings for that world of which he seemed a part. Overbeck was a priest of Art, to whom it was a holy thing, and never a means of gaining money or men's applause.

The thanks of the Academy were voted to the retiring Secretary, Mr. Wright, for his long and faithful service.

Six hundred and twenty second Meeting.

June 14, 1870. — ADJOURNED ANNUAL MEETING.

The PRESIDENT in the chair.

Letters in acknowledgment of their election as Fellows were received from C. C. Perkins, Esq., Professor N. Holmes, and Dr. George Derby.

Dr. J. B. S. Jackson was appointed to the Auditing Committee in place of Dr. Ware, absent in Europe.

Professor Lovering proposed that Chapter I., Section II., of the Statutes of the Academy, be amended by the substitution of the word "five" for "three," and also for the word "two," so that the article shall read "and an annual assessment of five dollars, with such additional sum, not exceeding five dollars, as the Academy shall, by a standing vote, from time to time determine." Referred to a committee consisting of Messrs. Lovering, Clark, and Quincy.

The President called attention to the fact, that, in the new Dictionary of Latin and Byzantine Greek by Professor Sophocles, no mention is made of the "Glossary," published by the Academy as the seventh volume of its Memoirs, of which the later work is a development. He had reason to believe that the omission would be supplied.

The Vice-President and Professors Parsons and Holmes were appointed a committee to consider whether the cost of printing Professor Lovering's memoir upon the Aurora Borealis could rightly be defrayed from the Rumford Fund, and also what disposition should be made of any proceeds which might accrue from the republication by the Academy of Count Rumford's works.

It was voted to appropriate one hundred and fifty dollars to be expended by the Library Committee, and three hundred and fifty dollars to be expended by the Committee on Publications.

Mr. Porter C. Bliss made a communication on the Ethnology of the Indian tribes of the southern part of South America.

The President read by title the following papers: —

1. *Reconstruction of the Order Diapensiaceæ.* By ASA GRAY.

The name of this group was first used by Link, for a tribe of *Convolvulaceæ*, — which was wide of the mark. But the order was founded by Lindley in 1836 (Introd. Nat. Syst. ed. 2). The two genera and species of which it was constituted, however, have on the one hand been appended to *Ericaceæ*, as by Endlicher and Dr. Hooker, or on the other referred to *Polemoniaceæ*, as by Don, Fries, and Alph. DeCandolle. Decaisne, indeed, keeps up the order (Decaisne and LeMaout, Traité Gen. Bot.); but as he intercalates it between the *Pyroleæ* and *Vaccineæ*, admitting those and kindred groups as orders, his view coincides with that of Endlicher and Hooker. In the second and subsequent editions of the Man. Bot. N. United States, I had followed the other course. But, after an attentive study of the *Polemoniaceæ* of the Northern hemisphere, I can no longer recognize the relationship. The plants in question have neither the gamophyllous calyx, nor the convolute æstivation of the corolla, nor the usually three-cleft style, nor the hypogynous disk, nor the pretty large embryo with flattened or foliaceous cotyledons of *Polemoniaceæ;* nor do the latter anywhere show an approach to the stamens of *Diapensia*. That these points of difference from *Polemoniaceæ* are all, with one exception, points of agreement with *Ericaceæ*, must be conceded, as also the similarity of habit. But the complete absence of an hypogynous disk, and the insertion of the stamens upon (instead of with) the corolla, are characters which ought to weigh heavily, in the absence of all the peculiar marks of *Ericaceæ*, — such, for instance, as the indusiate stigma, tetrahedral pollen, &c. Dr. Hooker, after due mention and consideration of these points (in Kew Jour. Bot. 9, p. 372), yet finds, in his remarkable genus *Diplarche*, strong evidence of a transition between *Diapensia* and *Loiseleuria*, his genus having one set of stamens adnate high up on a corolla which much resembles in shape that of *Diapensia Lapponica*. But *Diplarche* exhibits the disk, the stigma, and the pollen characteristic of *Ericaceæ*, and has neither the filament nor the anther of *Diapensia* and *Pyxidanthera*.

There is a genus, however, which accords with these in the whole general structure of the flower, and even in that of the filament and anther. This is *Shortia*, Torr. & Gray, published, upon most imperfect characters, at the close of an article of mine in the American Journal of Science and Arts, vol. 42, in the year 1841, two years earlier, apparently, than the fully characterized *Schizocodon* of Siebold and Zuccarini. The history of this genus, and of the identification of the almost unknown Alleghanian plant with that of Japan, is given in the following note,*

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* "At the end of the separate herbarium of Michaux, in the museum of the *Jardin des Plantes*, Paris, is preserved a specimen, ticketed, 'Hautes montagnes de Carolinie, an Pyrola spec.? an genus novum?' The scapes bear the dehiscent capsule, tipped with a style, and surrounded by the sepals; the corolla and stamens are absent. A sketch of the specimen, a leaf, and the summit of one of the scapes were obligingly presented to me by Professor Decaisne. With more zeal than judgment, I drew up the characters from this unique and incomplete specimen, and in this Journal for January, 1841, in a note to an account of a botanical excursion to the mountains of North Carolina, I published the plant under the name of *Shortia galacifolia*, Torr. & Gray. Contrary to my hopes and expectations, the plant has not yet turned up in its native haunts. The late Dr. Short, who has since gone to his rest, deserved better commemoration at our hands than this empty name of a most obscure plant. Indeed, our botanists, applying the old law maxim, *De non apparentibus et de non existentibus eadem est ratio*, are not unreasonably doubting if there ever was any such plant. Some lucky botanist will probably rediscover it in the region around the Black Mountains. What I have now to announce is, that the genus is found, and probably the very species, in a widely distant region indeed, but just where, after all we have been learning, it was not unnatural to expect it.

"In the year 1843, if I mistake not (I cannot at this moment ascertain the exact which was published in the Journal above mentioned, in the year 1867.

Finally *Galax* of Linnæus, — a genus of undetermined affinity, — as I now perceive, has its floral peculiarities and its relationship explained upon comparison with *Shortia* or *Schizocodon*. Its corolla (still somewhat gamopetalous, as Baillon remarks in Adansonia, 1, p. 196) is deeply parted; and the stamens with the interposed squamulæ, or sterile series of stamens, are connate into a tube, which not a little resembles the corolla of *Diapensia*, the fertile stamens occupying the sinuses of its petaloid divisions instead of those of the corolla. The style also is short, and there is no persistent columella in the axis of the capsule. *Galax* has been referred to *Pyrolaceæ;* but the points of resemblance are few, and the differences many and great, in corolla, andrœcium, style, seeds, &c.

If, then, these two outlying genera are truly related to *Diapensia*, as I suppose them to be, the group which they compose will hardly be referred to *Ericaceæ*. As a distinct small order, *Galax* included, the name *Diapensiaceæ* should be preferred to *Galacineæ*. For Don's order *Galacineæ*, though the earlier in date, was a thoroughly heterogeneous assemblage.

The diagnoses of the genera here brought together are as follows: —

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date, none being given in the separate issue), the late Professor Zuccarini published a plant from the mountains of Japan under the name of *Schizocodon soldanelloides;* and Dr. Maximowicz last year added two other species, *S. ilicifolius*, which he thinks too closely resembles the original species, and *S. uniflorus*. Of the latter, as well as of *S. soldanelloides*, Dr. Maximowicz has obligingly supplied me with specimens. *S. uniflorus* appears to differ (and perhaps too little) from the original species chiefly in the single-flowered scape, broader bracts, broader and more numerously-nerved sepals, and more slender style. Of this as of *Shortia galacifolia*, the corolla and stamens are unknown. Until these parts are found, and prove to be different, I may venture to assume that the two are identical!

"Dr. Maximowicz, the latest and best botanical explorer of Japan and the adjacent regions northward, and whose excellent specimens have been liberally supplied to some of the principal herbaria of this country (where they are most interesting), is sedulously engaged upon a *Flora Japonica*. It should be left for him to decide which generic name should be adopted, the earlier and incomplete or the later and complete one.

"As to the affinities of the genus, I had thought mostly of *Galax*, itself of undetected relationship. The fringed Soldanella-like corolla and the similar foliage are unaccompanied by any other structural resemblances. Zuccarini simply refers the genus to *Polemoniaceæ;* and I will add that its nearest known relative is *Diapensia*."

ORD. DIAPENSIACEÆ, Lindl. (auctus.) Herbæ perennes, nunc suffruticuloso-perennantes, alternifoliæ, pentameræ, gamopetalæ; calyce 5-sepalo persistente corollaque hypogynis æstivatione quincuncialibus; staminibus corollæ adnatis laciniis ejusdem alternis, filamentis sæpius dilatatis, antheræ loculis horizontaliter vel oblique bivalvibus; polline simplici; disco plane nullo; ovario (ima basi lata cum calycis fundo levissime concreta) 3-(raro 4-) loculari; stylo unico; stigmate subtrilobo nudo; ovulis indefinite numerosis in placentis axilibus anatropis vel amphitropis; capsula loculicida; seminum testa reticulata nucleo conformi vel relaxata; embryone parvo tereti in albumine carnoso, cotyledonibus brevissimis.

TRIBUS I. DIAPENSIEÆ. — Filamenta petaloideo-dilatata, corollæ campanulatæ usque ad sinus adnata; sterilia nulla: antheræ biloculares. Placentæ crassæ columellæ persistenti adnatæ. — Plantæ suffruticuloso-cæspitantes, depressæ, sempervirentes, foliosissimæ; foliis parvis sessilibus enervibus integerrimis; floribus terminalibus solitariis.

1. PYXIDANTHERA, Michx. Calyx pluribracteatus. Antheræ loculi rima transversa bivalves, valvula inferiore cuspide appendiculata. Ovula in loculis plurima, amphitropa. Semina subglobosa, testa nucleo conformi. — Laxe repenti-cæspitans, flore inter folia rosulata sessili. — P. BARBULATA, Michx. Fl. 1, t. 17; Gray, Bot. Text Book, ed. 3, cum ic. xyl.; Lindl. Veg. Kingd. p. 606, cum ic. xyl.; Bot. Mag. t. 4592.

2. DIAPENSIA, L. Calyx 2–3-bracteatus. Antheræ muticæ loculi basi divergentes obliqui, rima descendente bivalves. Ovula in loculis numerosissima, anatropa. Semina subcubica, testa nucleo subconformi. — Pulvinato-cæspitantes, pedunculo saltem fructifero evoluto scapiformi. — D. LAPPONICA, L. (Decaisne & LeMaout. Trait. Bot. p. 235, cum ic. xyl. opt.) 2 D. HIMALAICA, Hook. f. Kew Jour. Bot. p. 372, t. 12.

TRIBUS II. GALACINEÆ. — Filamenta fertilia (complanata) cum totidem sterilibus vel squamulis alternis connata, vel discreta. Antheræ muticæ. Ovula anatropa. Semina sursum imbricata, testa relaxata, ad chalazam producta. — Herbæ acaules; foliis longe petiolatis rotundato-cordatis plus minus dentatis venosis perennantibus scapisque elongatis racemoso-uni–multifloris e rhizomatibus repentibus ortis.

3. SHORTIA, Torr. & Gray, 1841, (*Schizocodon*, Sieb. & Zucc. 1843.) Corolla infundibuliformi-campanulata, 5-loba; lobis fimbriato-multifidis.

Stamina discreta: filamenta fertilia usque ad faucem (sub sinubus) adnata: antheræ biloculares fere *Diapensiæ*, loculis connectivum marginantibus demum transversis. Squamulæ seu filamenta sterilia oppositipetala corollæ supra basim inserta, lineares. Stylus elongatus. Semina in placentis amplis columellæ persistenti adnatis numerosissima, sursum imbricata, oblique ovata, ad chalazam obtuse apiculata. — Folia repando-dentata, sæpius retusa, laxe venosa. Scapus uni–pauciflorus, superne squamoso-bracteatus, bracteis sepalisque demum chartaceis nervosis. — S. GALACIFOLIA, Torr. & Gray in Sill. Jour. l. c. — *Schizocodon soldanelloides*, Sieb. & Zucc., Act. Acad. Monac. 1843, t. 2, f. 1, *S. ilicifolius* et *S. uniflorus*, Maxim. aut species peraffines, aut in unicam conjungendæ?

4. GALAX, L. Corolla 5-partita, lobis obovato-spathulatis integerrimis. Stamina 5 fertilia cum sterilibus squamulisve in tubum basi corollæ adnatum apice 10-dentatum connata, dentibus subspathulatis, fertilibus quam sterilia brevioribus et apice latioribus antheram unilocularem tranversim bivalvem introrsum adnatam gerentibus. Stylus brevissimus. Placentæ ab axi sæpius tripartibili dissepimentis adnata secedentes. Semina plurima, angusta, sursum longe attenuata. — Folia crebre dentata, reticulata. Scapus nudus, racemum multi- et parviflorum gerens; bracteis minimis fere obsoletis. — G. APHYLLA, Linn. *Erythrorhiza rotundifolia*, Michx. Fl. 2, p. 35, t. 36.

2. *Revision of the North American Polemoniaceæ.* By ASA GRAY.

I. *Stamina inæqualiter inserta.*

1. PHLOX. Corolla hypocraterimorpha. Filamenta brevia, inclusa. Ovula in loculis 1 – 5. Semina sub aqua immutata, tegumento simplici albumini adhærente. — Folia integerrima, saltem inferiora opposita.

2. COLLOMIA. Corolla aut hypocraterimorpha aut infundibuliformis. Filamenta gracilia, sæpius exserta. Ovula in loculis solitaria, pauca, vel plurima. Semina humefacta mucilaginosa spirillifera. — Folia omnia vel plera alterna, sæpius pinnatipartita vel incisa.

II. *Stamina æqualiter inserta. Semina humectata plerumque spirillifera vel mucilaginosa.*

3. GILIA. Corolla a hypocrateriformi ad subrotatam. Filamenta haud declinata inappendiculata. — Folia varia.

4. POLEMONIUM. Corolla ab infundibuliformi ad rotatam. Filamenta gracilia, plus minus declinata, basi piloso-appendiculata. Folia alterna, pinnatisecta.

These are the best diagnostic characters to be had for the Polemoniaceous genera with which we have here to do. One other, *Lœselia*, is not unlikely to be found along our Mexican frontier. The genera at first sight would appear to be more obviously and strictly limited than they actually prove to be; and, except for certain connecting forms, their number might be properly increased by the severance of one polymorphous genus into several, which, for the want of a little extinction, just fail to establish their characters. These plants may also interest the philosophical botanist in another particular, namely, in what seems to be the indications of an incipient dimorphism, discernible in sundry species, but in none of them, perhaps, completely carried out into reciprocally long and short filaments and style. For instance, in some species of *Gilia*, section *Leptosiphon*, the style is long in some individuals and short in others, while the stamens are uniform; on the other hand, at least in one species of the section *Ipomopsis* the stamens are exserted in some individuals and included in others, with little or no obvious difference in the style. In view of these facts, we may suspect that the two sorts of style which Professor Thurber and Professor Torrey have detected in the genus *Phlox* (namely, that more than half the species have a long style, so that the stigmas are often exserted, while the rest have very short ones, bearing the stigmas low down in the tube of the corolla) are somehow of dimorphic nature. Yet it is only in *P. subulata* that I have seen both long and short styles; and here the short-styled plant has (irrespective of this character) been described as a distinct species (*P. nivalis*, *P. Hentzii*), and is apt to have a pair of ovules in each cell, while the long-styled *P. subulata* rarely shows more than one. Moreover, in the *Speciosa* group this character of the style really furnishes one of the most available specific distinctions. Whatever view be taken of it, the case may properly be compared with that of certain species of the generally dimorphic genus *Primula*, mentioned by Mr. Scott (in Jour. Linn. Soc. 8, p. 80), which, so far as known, are either long-styled or short-styled without their complementary fellow. Similarly the two species of *Gilia* composing the group which I have named *Giliandra* might be regarded as the long-stamened form, of which the short-stamened counterpart is unknown or non-existent. A state of things which, although singular, is intelligible upon the doctrine of the gradual evolution of specific and dimorphic differences.

1. PHLOX, L.

Corolla hypocraterimorpha, ore angusto. Stamina tubo valde inæqualiter inserta: filamenta brevissima vel brevia, inclusa. Stylus nunc elongatus, faucem adæquans vel superans, nunc brevissimus. Ovula in loculis 1, 2, rarissime 3 – 5. Semina sub aqua immutata, tegumento simplici albumini adhærente nec mucilagine nec spirillis prædito. — Herbæ vel suffruticuli Amer. Borealis, foliis integerrimis, caulinis sessilibus oppositis summisve alternis, corollæ æstivatione maxime convolutiva.

§ 1. *Latifoliæ, Perennes,* Americæ Boreali-Orientales, uniovulatæ.

* *Thyrsifloræ;* cymulis compactis in paniculam floribundam vel thyrsum digestis, pedicellis brevissimis; caule elato stricto; corollæ lobis integerrimis.

1. P. PANICULATA, L. *P. paniculata* (forma pubescens) & *P. acuminata,* Pursh, Benth. in DC. *P. undulata,* Ait. *P. Sickmanni,* Lehm. *P. scabra,* Sweet, Brit. Fl. Gard. t. 248. *P. cordata,* Ell.; Brit. Fl. Gard. n. ser. t. 13. *P. corymbosa,* Sweet, l. c. t. 114, a rough-pubescent form. *P. glandulosa,* Shuttleworth, coll. Rugel, pubescent form.

2. P. MACULATA, L., Jacq. Vind. t. 127. *P. pyramidalis,* Smith, Exot. 2, t. 87; Brit. Fl. Gard. t. 233; very floribund cultivated state. *P. odorata,* Sweet, Brit. Fl. Gard. t. 224. *P. reflexa,* id. t. 232 (hybrid). *P. penduliflora,* Sweet, l. c. n. ser. t. 46. *P. suaveolens,* Ait. Kew.; form with white flowers and stem often spotless, to which belong *P. tardiflora,* Penny ex Benth., and *P. longiflora,* Sweet, Brit. Fl. Gard. ser. t. 31.

* * *Corymbosæ;* cymulis corymbosis nunc simplicibus; caulibus erectis vel patentibus; corollæ lobis latis integerrimis vel obcordatis.

+ *Glaberrimæ,* nitidæ, erectæ vel adscendentes; calycis lobis latis; corollæ lobis rotundatis integerrimis. Rarius corymbo vel caule scabro-puberulo.

3. P. OVATA, L. Sp. ed. 1, p. 152. Caulibus e basi decumbente vel repente adscendentibus (subpedalibus); foliis ovatis nunc oblongo-lanceolatis summisve subcordatis, infimis in petiolum angustatis; calycis dentibus brevibus ovatis seu lato-lanceolatis acutis. — Bot. Mag. t. 528. *P. Carolina,* var. *ovata,* Benth. in DC. *P. latifolia,* Michx. Fl. 1, p. 143. — Var. elatior; foliis lato- seu ovato-lanceolatis, calycis denti-

bus acutatis. *P. Carolina*, L. Sp. ed. 2. *P. triflora*, Brit. Fl. Gard. t. 293. Open woods, &c., upper country of Alabama and Carolina along the Alleghanies to Huntingdon Co., Penn., Porter. — *P. ovata* is the earlier name (although rendered somewhat obscure by the char. "floribus solitariis," which was taken from Plukenet's figure), and is the more to be preferred as the original of *P. Carolina* is one of those forms which seem to pass gradually into *P. glaberrima.* The Carolinian specimens of "Gray and Carey," referred in the Prodromus to *P. glaberrima*, are clearly of the present species.

4. P. GLABERRIMA, L. Caulibus gracilibus erectis (1 – 2-pedalibus); foliis lineari- nunc oblongo-lanceolatis summisve anguste ovato-lanceolatis superne sensim angustatis acuminatis firmioribus subaveniis margine subrevolutis, pagina superiore nitida; calycis dentibus triangulari- seu lanceolato-subulatis acutissimis. — Brit. Fl. Gard. n. ser. t. 36. *P. glaberrima* & *P. Carolina* var. *nitida* & *puberula*, Benth. in DC. *P. triflora*, Michx.; forma corymbo ramosiore laxiore. *P. nitida*, Pursh. *P. suffruticosa*, Willd. Enum.; Bot. Reg. t. 68. *P. carnea*, Sims, Bot. Mag. t. 2155; Lodd. Bot. Cab. t. 711. *P. Carolina*, Walt.; Sims, Bot. Mag. t. 1344, var. caule scabro-puberula. *P. revoluta*, Aikin in Eaton Man. — Prairies and open grounds, Ohio and Wisconsin to Florida and Louisiana.

+- +- *Pilosæ* seu *Glandulosæ;* caulibus floriferis erectis vel patentibus; calycis pl. m. pilosi sæpius viscidi dentibus elongatis angustis seu angustissimis; corollæ lobis nunc retusis vel obcordatis.

++ Estolonosæ.

5. P. FLORIDANA, Benth. in DC. Caule stricto bipedali cum foliis lineari- seu oblongo-lanceolatis rigidulis pilosulo vel glabello apice cum corymbo glanduloso, calycis glandulosi dentibus lanceolato-setaceis; corollæ lobis obovatis integerrimis. — Chapm. Fl. p. 339. *P. Carolina*, Sweet, Brit. Fl. Gard. t. 190? — Dry open woods, Florida, Chapman, Rugel, &c. Distinguished from *P. glaberrima* by the much longer and narrower teeth of the glandular-pubescent calyx.

6. P. PILOSA, L. Caule erecto gracili (1 – 2-pedali) cum foliis lanceolatis linearibusque (sæpius a basi sessili ad apicem sensim attenuatis) villoso piloso vel pubescente nunc glabrato; corymbo demum aperto; calycis aut hirto-villosi aut pubescens subviscidi dentibus elongato- vel tenuissime subulato-setaceis superne nunc aristiformibus; corollæ lobis obovatis integerrimis. — Bot. Mag. t. 1307; Lodd. Cab.

t. 1251. *P. aristata*, Michx.; Lodd. Cab. t. 1731; Torr. Fl. N. Y. 2, t. 80. — New Jersey to Saskatchawan, Florida, and Texas. Variable in foliage, pubescence, &c.

Var. DETONSA: forma gracillima, sæpius angustifolia, lævis, corymbo calyceque modice parumve pubescentibus. — *P. aristata*, Benth. pro parte. — Florida, Alabama, Louisiana, Texas.

7. P. AMŒNA, Sims. Pube molli rarius hirtella pl. m. villosa; caulibus adscendentibus simplicibus (6 – 15-pollicaribus); foliis erectiusculis oblongis lanceolatis seu lineari-lanceolatis acutiusculis obtusisve, summis corymbum compactum bracteantibus; calycis dentibus anguste subulatis acutissimis vix aristatis; corollæ lobis obovatis integerrimis raro emarginatis. — Bot. Mag. t. 1308. *P. pilosa*, Walt., Michx. &c. non L. *P. pilosa?* var. *Walteri*, Gray, Man. ed. 2. *P. Walteri*, Chapm. Fl. p. 338. *P. procumbens*, Gray, Man. ed. 5, vix Lehm. *P. involucrata*, Nutt. herb. — Barrens, dry hills, &c., Virginia and Kentucky to Florida. Some forms nearly approach *P. pilosa*, with which it has been confounded, especially when *P. aristata* has been regarded as distinct.

++ ++ Substoloniferæ, e basi caules steriles reptantes vel decumbentes proferentes: folia breviuscula lata.

8. P. DIVARICATA, L.; Bot. Mag. t. 163. *P. Canadensis*, Sweet, Brit. Fl. Gard. t. 221. Corollæ lobi obcordati vel cuneati emarginati, nunc, in Var. *Laphamii*, Wood. integerrimi. *P. glomerata*, Nutt. herb. *P. glutinosa*, Buckley in Sill. Journ. 45, p. 177, as to the specimens, but the char. "flowers bright red or scarlet," must belong to something else, perhaps to some confusion of memory.

9. P. REPTANS, Michx.; Vent. Malm. t. 107. *P. stolonifera*, Sims, Bot. Mag. t. 563; Sweet, Brit. Fl. Gard. n. ser. t. 293. Both names date from the year 1803. *P. crassifolia*, Lodd. Bot. Cab. t. 1596. As Dr. Torrey has noted, this species has a long, often exserted style, the preceding a very short one, — characters we may suspect to be related to dimorphism; but if so the counterpart form has not been observed.

* * * *Sparsifloræ*, linearifoliæ, humiles, diffusæ; corollæ pallide violaceæ lobis cuneatis in segmenta angusta (linearia seu oblonga) bifidis.

10. P. BIFIDA, Beck.; Gray, Man. Pubescens; foliis nunc glabratis; corollæ lobis ultra vel ad medium usque in segmenta sublinearia bifidis. — Prairies of Illinois and Missouri; in spring.

11. P. STELLARIA, n. sp. Glaberrima, cæspitosa, basi subperennante; foliis angusto-linearibus rigidulis, superioribus basi parum ciliatis; pedunculis plerumque unifloris elongatis; corollæ "pallide cœruleæ nunc fere albæ" lobis apice in segmenta brevi-oblonga bifidis. — "Cliffs of Kentucky River (probably above Lexington), in the fissures of the most precipitous rocks," found only by the late Dr. Short, May 1, 1829. The station should be rediscovered. Flowers as large as those of the foregoing species. Named from the resemblance to a *Stellaria* both in foliage and blossoms.

§ 2. *Subulatæ, Suffrutriculoso-perennantes, Cis-Missisippianæ*, sempervirentes, uni–biovulatæ; foliis fasciculatis; corollæ lobis tantum obcordatis.

(P. PROCUMBENS, Lehm. Ind. Sem. Hamb. 1828; Sweet, Brit. Fl. Gard. n. ser. t. 7 — referred by Bentham to *P. subulata* var. *latifolia*, — in some specimens nearly approaches *P. subulata*, in others is more like *P. amœna*, for which in Manual, ed. 5, I mistook it. It is unknown as an indigenous plant, and is probably a hybrid of the two species above mentioned.)

12. P. SUBULATA, L. *P. subulata* & *P. setacea*, L. Chiefly with long style and solitary ovules. — *P. nivalis*, Lodd. Bot. Cab. t. 780; Sweet, Brit. Fl. Gard. t. 185; form with short style, ovules commonly, but not always, in pairs (rarely 3) in each cell, and corolla white. *P. aristata*, Lodd. l. c. t. 1731. *P. Hentzii*, Nutt., with white corolla, its lobes entire or nearly so, short style, and, in Nuttall's specimens, solitary ovules. — Dry open ground, New York to Michigan and Florida.

§ 3. *Occidentales* (transmontanæ et montanæ), suffrutescentes vel suffruticulosæ, raro a basi usque herbaceæ, uni – triovulatæ; ramis uni – paucifloris; foliis plerumque angustis vel parvis margine sæpius pl. m. cartilagineo-incrassatis. Species difficillimæ ut videtur inosculantes.

* *Pulvinato-cæspitosæ*, suffruticuloso-perennantes, sempervirentes; foliis brevibus nunc minimis usque ad flores solitarios (sessiles, in postrema nunc brevi-pedunculatos) confertis imbricatisve ac fasciculatis basibus scarioso-connatis, vetustis marcescentibus; ovulis solitariis. Species a minimis imbricatifoliis ad laxiores patentifolias ordinatæ.

+ Folia saltem ad margines pilis arachnoideis instructa,

++ Brevissima, latiuscula vel squamiformia, imbricata, mollia, tantum mucronata. Plantæ pulvinatæ musciformes; corollæ lobi integerrimi.

13. P. RICHARDSONII, Hook. Fl. 2, p. 73, t. 160. Laxius pulvinata; foliis oblongo-lanceolatis (lin. 3 longis) parcius lanigeris marginibus incrassatis mox reflexis imbricatis, vetustis laxe patentibus; corollæ "læte lilacinæ," tubo calycem dimidio excedente, lobis late cuneato-obovatis lin. 3 longis. — Arctic sea-shore.

14. P. BRYOIDES, Nutt. Pl. Gamb. p. 153. Densius pulvinata, minima, facie *Selaginellam rupestrem* referens, copiose mollissime lanata; ramulis discretis; foliis arcte quadrifariam imbricatis squamæformibus ovato- seu triangulari-lanceolatis (sesquilineam longis) etiam marcescentibus creberrime appressis, marginibus subinflexis; corollæ tubo calycem modice superante, lobis cuneatis sesquilineam longis. — Dividing ridge of the Rocky Mountains (about lat. 42°), Nuttall.

15. P. MUSCOIDES, Nutt. Jour. Acad. Philad. 7, p. 42, t. 6, p. 2 Præcedenti similis, *Bryum* aliquid canescens referens; ramis brevibus confertissimis; foliis minus stricte quadrifariis parcius lanatis ovato-lanceolatis parum mucronulatis (sesquilineam longis); corollæ tubo calycem haud superante. — Rocky Mountains at the sources of the Missouri River, Wyeth.

++ ++ Folia rigidiora, subulata, subacerosa (lin. 3 – 4 longa), minus appresso-imbricata. Plantæ late cæspitantes, corollis ut videtur albis.

16. P. HOODII, Richards. Appx. t. 28. Parcius lanata, glabrata; foliis erectis; corollæ tubo calycem haud superante, lobis obovatis integris, 2 – 2½ lin. longis. — Through the Saskatchawan region from lat. 54° to the Rocky Mountains about lat. 44°.

17. P. CANESCENS, Torr. & Gray, Pacif. R. R. 2, p. 8, t. 6. Magis lanata, canescens; foliis e basi appressa mox patentibus vel subsquarroso-recurvis; corollæ tubo calycem pl. m. sæpius dimidio superante, lobis obovatis integris vel emarginatis lin. 3 – 4 longis. — Rocky Mountains of Colorado and throughout Utah to New Mexico and the Sierra Nevada.

++ ++ Folia rigidiora marginibus basi saltem hirsuto- vel hirtello-ciliata, nunc nuda.

18. P. CÆSPITOSA, Nutt. l. c. t. 6, f. 1. Dense seu laxiuscule cæspitosa; foliis rigidis lineari-subulatis seu oblongo-linearibus (lin. 4 – 6

longis) crebris vel creberrimis hispido- vel hirtello-ciliatis cæterum glabris vel parce hirtello-glandulosis; corollæ tubo calycem parum superante, lobis obovatis integris lin. 3 longis. — Var. RIGIDA: depressa; foliis aceroso-subulatis demum recurvo-patentibus parce glanduloso-hirtellis. *P. rigida*, Benth. in DC. — Var. CONDENSATA: pulvinato-cæspitosa; foliis brevibus (lin. 2 – 3 longis) creberrime arrecto-imbricatis. *P. Hoodii*, var. Gray, Enum. Pl. Parry. (298) in Sill. Jour. — Rocky Mountains, Colorado to Montana, Oregon, and high Sierra Nevada.

19. P. DOUGLASII, Hook. Cæspitoso-ramosissima, pubescens vel glabella; foliis rigidulis acerosis sæpius patentibus minus crebris, marginibus aut nudis aut basi hirsutiusculo-ciliatis; flore subsessili; corollæ (purpureæ seu albæ) tubo calycem pl. m. superante, lobis obovatis integris lin. 3 longis. — Hook. Fl. 2, p. 73, t. 158. — Var. DIFFUSA: ramis procumbentibus foliisque laxioribus patentibus minus rigidis. — Var. LONGIFOLIA: ramis sæpius erectis e rhizomate prostrato; foliis angustissime vel aceroso-linearibus lin. 5 – 8 longis minus fasciculatis. *P. Hoodii*, Torr. Ann. Lyc. 2, p. 220, & in Frem. Rep. *P. Sibirica*, Hook. Kew Jour. Bot. 3, p. 290. — High plains and mountains, Montana, Colorado, and Utah, west to the Sierra Nevada and the Cascades; the var. diffusa on the Pacific slopes from the Yosemite to lat. 49°, the var. longifolia east of the Rocky Mountains and in Utah. This makes nearly a transition to *P. longifolia*, Nutt. One of Nuttall's specimens of this form, named by him *P. andicola*, exhibits, along with flowers having the usual inequality in the stamens, one or two with stamens perfectly equally inserted in the throat of the corolla!

* * *Speciosæ*, basi tantum lignosæ nunc herbaceæ, multicipites vel laxe cæspitantes; foliis vulgo longioribus linearibus lanceolatisve raro subovatis laxis nec parumve fasciculatis; floribus solitariis vel subcymosis longius pedunculatis!

+ *Longistylæ*.*

++ *Frigidæ*; foliis caulibusque laxe cæspitantibus subflaccidis.

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* The character of the style — in this division elongated and frequently equalling the tube of the corolla, in the other hardly exceeding or even equalling the ovary and the stigmas — may be suspected to be dimorphic, as I have supposed to be the case in *P. subulata*. But in this group there is no evidence of it; and the character is most convenient and useful in the arrangement of these otherwise almost inextricable Western Phloxes.

20. P. Sibirica, L. Bi-quadripollicaris, piloso-pubescens; foliis angusto-linearibus margine sæpius villosulis; pedunculis nudis unifloris; corollæ tubo lobis suis obcordatis retusisve calycique æquilongo vel paullo longiore; ovulis in loculis binis. (Gmel. Fl. Sib. 4, t. 46, f. 2.) Trautv. Imag. Fl. Russ. t. 24. — Kotzebue's Sound and E. Siberia.

++ ++ *Temperatæ;* foliis cum caulibus basi suffruticosis erectis vel adsurgentibus rigidulis: corolla alba seu rosea, tubo lobos calycis angusto-subulatos superante.

a. Stenophyllæ: calycis tubus ad basim usque membranulis intercostalibus scariosis mox replicatis sæpius angulatus.

21. P. Linearifolia. Glaberrima vel superne nunc hirtello-pubens, spithamæa ad pedalem, corymboso-floribunda; foliis angustissime linearibus (1 – 2-pollicaribus); calycis tubo e basi lata inter costas eximie membranaceo-angulata quasi pyramidato, dentibus aceroso-subulatis; corollæ tubo calycem paullo excedente, lobis obovato-cuneatis integris raro retusis; ovulis in loculis binis. — *P. speciosa* var. *linearifolia*, Hook. Kew Jour. Bot. 3, p. 289, pro parte. *P. speciosa*, Lindl. Bot. Reg. t. 1351; Benth. in DC., non Pursh. — Interior plains of the Columbia River and its tributaries, the Kooskooskie, Clearwater, &c., Douglas, Spalding, Geyer, Burke, Lyall.

22. P. Longifolia, Nutt. Jour. Acad. Philad. 7, p. 41. Glabra vel pubescens, circa spithamæa; foliis angustissime vel angusto-linearibus (1 – 2½-pollicaribus) quandoque lanceolatis; corollæ lobis obovato- seu oblongo-cuneatis integris retusisve; ovulis in loculis fere semper solitariis. — *P. speciosa*, *β*. Hook. Fl. 2, p. 72, &c. *P. humilis*, Dougl. in Benth. l. c. — a small form, with shorter peduncles, sometimes apparently passing into *P. Douglasii*, var. *longifolia*. — Var. Stansburyi: validior; pube ramorum calycisque pl. m. glandulosa seu viscosa, foliis vulgo latioribus; corollæ tubo calyce sæpius duplo longiore, lobis apice nunc emarginatis nunc erosis; loculis 1 – 2 ovarii quandoque biovulatis. *P. speciosa*, var.? *Stansburyi*, Torr. Bot. Mex. Bound. p. 145. — Forma brevifolia, nana; foliis nunc angusto- nunc oblongo-lanceolatis semipollicaribus. — Rocky Mountains to the Cascades and Sierra Nevada, and from Washington Territory to Nevada and Utah. The var. Stansburyi and its short-leaved form chiefly in the southern districts, and extending into New Mexico and Arizona. This also has usually uniovulate cells, but with one or two (rarely perhaps all three) cells sometimes 2-ovuled.

b. Brachyphyllæ: calyx sinubus scariosis vix replicatis subteres.

23. P. ADSURGENS, Torr. in herb. Præter inflorescentiam glabra; caulibus diffusis adscendentibus gracilibus (subpedalibus); foliis ovatis seu ovato-lanceolatis acutis semipollicaribus plerumque internodiis multo brevioribus; pedunculis subcymosis calyceque glanduloso-pubescentibus; corollæ tubo calyce subduplo longiore, lobis obovatis integris; ovarii loculis uniovulatis. — "Cañon Pass, Oregon," Prof. A. Wood. — Tube of the corolla nearly an inch, its lobes five lines, long. Style exserted. — Peculiar as this appears, some of the short-leaved forms referred to the preceding species make an approach to it.

+ + *Brevistylæ*, nempe stylo quam stigmata ovariumque vulgo breviore. Calyx membranulis intercostalibus haud replicatis cylindraceus, lobis subulatis.

24. P. SPECIOSA, Pursh. Subviscoso-puberula vel glabrata, 1–4-pedalis; ramis e basi lignosa decumbente adsurgentibus; foliis lanceolatis seu linearibus (sesqui–bipollicaribus), supremis basi plerumque dilatatis; floribus corymbosis; corollæ roseæ seu albæ tubo calycem parum superante, lobis obcordatis; ovulis in loculis solitariis. Pursh! Fl. 1, p. 149. *P. speciosa*, var. *latifolia*, Hook. Kew Jour. 3, p. 289. *P. occidentalis*, Durand in Pacif. R. R. 4, p. 125, forma latifolia. — Interior plain of the Columbia, Washington Territory, to the foot hills of the Sierra Nevada, California. — Determined from an original specimen of herb. Lamb., now of herb. Kew, collected on the "Plains of the Columbia, about 4 feet high, May 7, 1806," Lewis and Clarke: although injured, the obcordate lobes of the corolla are conspicuous. Corolla in the larger specimens an inch or even more in diameter.

Var. SABINI: corollæ lobis obovatis basi cuneatis integerrimis vel retusis. — *P. speciosa*, var. *elatior*, Hook. Fl. l. c. *P. Sabini*, Dougl. in Hook. & Benth. l. c. — Spokan River, Washington Territory.

Var. WOODHOUSII: nana; foliis linearibus basi nec dilatatis; floribus dimidio minoribus; corollæ lobis cuneatis obcordatis. — *P. Woodhousii*, Torr. ined. *P. nana*, Torr. Sitgreaves Rep. p. 165, non Nutt. — Arizona (lat. 35°, long. 112° 20′), Woodhouse in Sitgreaves Exped.

25. P. NANA, Nutt. Pl. Gamb. l. c. Glanduloso-pubescens vel hirtella, nunc glabrata, e basi frutescente patenti-ramosa, spithamæa ad pedalem; foliis linearibus, ramealibus sæpe alternis; floribus sparsis;

corollæ "rubræ" roseæ vel "albæ" tubo calycem paullo superante, lobis amplis latissime cuneato-obovatis integris nunc erosulis; ovulis in loculis 3, rarius binis. *P. triovulata*, Thurber in Bot. Mex. Bound. p. 145. — Var. GLABELLA: ramis simplicioribus erectis; foliis angustioribus. — New Mexico (near Santa Fé, &c.) and adjacent borders of Texas and Colorado. (No. 1654, Wright, may be added to the numbers cited in Mex. Bound. Survey; this and 504 are of the smoothish and more erect variety.) Limb of the corolla commonly an inch, sometimes an inch and a quarter in diameter: apparently a showy species. No state of the plant seen can justly be described as "canescently pubescent."

§ 4. *Annuæ, Texenses,* laxe ramosæ, plus minus viscoso-pilosæ (pilis multiarticulatis plerumque glandula parva terminatis); foliis latiusculis, superioribus alternis; calycis (fructiferi fere ad basim usque fissi) lobis setaceo-apiculatis mox recurvis vel patentibus; stylo stigmatibus breviore; seminibus subalato-angulatis.

* *Uniovulatæ,* corymbifloræ.

26. P. DRUMMONDII, Hook. Bot. Mag. t. 3441; Bot. Reg. t. 1949, Brit. Fl. Gard. ser. 2, t. 316 (forma parviflora). Folia sæpius lanceolata seu oblonga, superiora basi subcordata semiamplexicaulia.

Var. VILLOSISSIMA: pilis viscosis longis crebris; foliis angusto-lanceolatis; floribus magnis subsparsis. — Texas, in the pebbly bed of the Nueces, Wright, no. 1656.

Var. TENUIS: spithamæa; pube breviore parciore in foliis plerumque linearibus basi nunquam dilatatis nunc evanida; cyma laxiflora; floribus parvulis; corollæ lobis obovato-cuneatis lin. 2 – 4 longis. — Eastern Texas, Berlandier (1822, &c.), Drummond (coll. 3, 312), Lindheimer (424), Wright.

* * *Pluri-*(4 – 5-) *ovulatæ,* sparsifloræ.

27. P. RŒMERIANA, Scheele in Linnæa, 21, p. 752. Humilis, e basi laxe ramosa, præter margines foliorum calycisque tubum hirsutos subglabra; foliis lanceolatis oblongis imisve spathulatis, caulinis plerumque alternis; corolla rosea ampla, tubo glabro calycis lobos lineares tantum patentes subæquante lobis suis latissime obovatis (lin. 6 – 9 longis) breviore; capsulæ loculis oligospermis. *P. macrantha,* Buckley in Proceed. Acad. Philad. 1862, p. 5. — Not rare in the central district of Texas, Lindheimer, Rœmer, Wright, Buckley, Thurber, &c.

In describing this remarkable species, neither Scheele nor Buckley mentions the annual root, nor the prevailingly alternate leaves, nor the numerous ovules; indeed, poor Scheele gives the character "loculis uniovulatis." Dr. Engelman has proposed to transfer this species to *Gilia;* but the number of ovules in these genera proves to be a wholly secondary character.

2. COLLOMIA, Nutt. mutatis mutandis.

Corolla tubuloso-infundibuliformis vel hypocraterimorpha, fauce sæpius sensim plus minus ampliata. Stamina fauci vel infra faucem *inæqualiter* inserta: filamenta gracilia, sæpe exserta. Ovula in loculis solitaria, pauca, vel plurima. Semina humefacta e tegumento simplici tubulos mucilaginosos plerumque spirilliferos creberrime protrudentia. — Herbæ annuæ, raro biennes, foliis alternis imisve oppositis sæpius incisis nunc pinnatisectis.

Of the two characters which in the Prodromus distinguish *Collomia* from *Gilia*, namely, the unequally inserted stamens and the solitary ovules, Bentham gave evident preference to the latter, as appears from his removal of *C. heterophylla* to *Navarretia;* yet uniovulate species are left in *Gilia*. As it is now abundantly evident that none of our Polemoniaceous genera can be made to rest upon the number of ovules, I rely so completely upon the remaining character that I propose to remove from *Gilia* to *Collomia* two multiovulate species, in which I detect a striking inequality in the insertion of the stamens, and even to add an unpublished species having a much-dilated throat to the corolla.

Collomia nudicaulis, Hook. & Arn., has very many ovules, and belongs to the *Leptosiphon* section of *Gilia*, although peculiar in its sessile anthers and entire leaves.

The "mucilage" so copiously developed on the surface of the seed when immersed in water, and which gave name to the genus, consists of innumerable and most delicate diaphanous tubes, which lengthen wonderfully when wetted. The spiral thread which they contain (on which account they were confounded with "spiral vessels," and which uncoils as the tube softens or dissolves into jelly) is wanting in one species, namely, *C. gracilis*. In this and in the several following species, the mucilage cells are beneath a more or less evident pellicle or epidermis, composed of fragile tabular cells, which are thrown off when the former develop and protrude under moisture. But this pellicle is not obvious in the typical species.

§ 1. EUCOLLOMIA. Ovula in loculis solitaria, in spec. ultima 2 – 3. Annuæ, plus minus viscoso-pubescentes. — *Collomia*, cum *Navarretia heterophylla*, Benth. in Prodr.

* *Genuinæ*, simplici- et sessilifoliæ, sæpius confertifloræ, calyce obconico, corolla angusta. Semina maxime spirillifera.

+ Flores capitato-glomerati, folioso-bracteati, infimi in dichotomiis nunc subsolitarii.

1. C. COCCINEA, Lehm., Benth. l. c. — Chili.

2. C. GRANDIFLORA, Dougl. — West of the Rocky Mountains. — Var. TENUIFLORA, Benth. in DC.: a form with a more slender corolla. Var. CRYPTANTHA, Regel: perhaps a sport of cultivation.

3. C. LINEARIS, Nutt. — Both sides of the Rocky Mountains, north to Mackenzie River: also on the shore of New Brunswick, Fowler, perhaps a waif.

Var. SUBULATA: spithamæa, divergenti-ramosa; foliis lineari-lanceolatis seu linearibus utrinque attenuatis; glomerulis laxiusculis alaribus imis paucifloris nunc unifloris; calycis lobis e basi lata attenuato-subulatis tubo parum longioribus. *C. tinctoria*, Kellogg in Proc. Acad. Calif. 3, p. 17, t. 2, ex char. — E. California and W. Nevada, Lobb (1857), Dorr, Stretch; Klamath Valley, Oregon, Kronkrite. And S. Watson collected in Nevada a form so intermediate as to forbid our regarding it as a distinct species.

+ + Flores omnes dissiti, in dichotomiis solitarii.

4. C. TENELLA, n. sp. Viscoso-puberula, e radice exili 3 – 4-pollicaris, pusilla, laxe ramosa; foliis linearibus uniformibus integerrimis obtusiusculis basi longius attenuatis, imis oppositis; floribus subsessilibus; calycis lobis triangulatis acutis tubo brevioribus corolla angusta fere hypocraterimorpha dimidio brevioribus. — Nevada, in Wasatch Mountains about Parley's Park, Watson in King's expedition. — Flowering almost from the base. Calyx broadly obconical, barely two lines long; the corolla at length four lines. Leaves about an inch long, all scattered.

* * *Intermediæ*, cymoso-sparsifloræ; foliis sessilibus integerrimis, inferioribus sæpius oppositis; calyce fere 5-partito basi obtusissimo. Semina sub aqua mucilaginosa sine spirillis.

5. C. GRACILIS, Dougl. Occurs under very various forms in the western parts of North and South America. *C. micrantha*, Kellogg, l. c. fig. 3, evidently belongs here.

* * * *Giliæformes;* foliis pinnatisectis incisis vel 3 – 5-partitis, inferioribus petiolatis alternis; calyce basi obtuso; corolla fere hypocraterimorpha. Semina sub epidermide tenerrima spirillifera.

6. C. GILIOIDES, Benth. Flores subsparsi, staminibus insertione minus inæqualibus. — Var. GLUTINOSA. Forma corolla sæpius longiore, staminibus magis inæqualiter insertis; ovulis raro binis. *C. glutinosa*, Benth. *Gilia* (*Allophyllum*) *divariata*, Nutt. Pl. Gamb. p. 155, a slender form. — These appear to be of one species. The protrusion or inclusion of the stamens is probably an individual character of incipient dimorphism, as is evidently the case in the next. — California.

7. C. HETEROPHYLLA, Hook. *Navarretia heterophylla*, Benth., cum syn. Flores pl. m. glomerati; staminibus valde inæqualibus; ovulis in loculis 2 – 3. — British Columbia to California.

§ 2. PHLOGANTHEA. Ovula in loculis plurima (6 – 12). Filamenta quandoque declinata, tum inæqualia tum inæqualiter inserta. Folia vel segmenta tenui-linearia integerrima. Thyrsifloræ vel sparsifloræ, nec viscidæ. Semina ut in prioribus spirillifera.

* Folia caulina semel pinnati-3 – 7-partita; corolla ad faucem usque angusta.

8. C. CAVANILLESIANA, Don. Biennis vel basi indurata perennis? pubescens vel puberula; caulibus ramisve virgatis foliosis; thyrso angusto sæpius racemiformi, pedunculis brevibus glomeruli-floris; corolla alba "luteo-albicante" Cav. seu purpurascente (semipollicari), tubo calyce 2 – 3-plo longiore superne paullo sensim ampliato, lobis oblongis; filamentis fauci plerumque subobliquo insertis; antheris rotundis; ovulis in loculis 5 – 7. *Phlox pinnata*, Cav. Ic. 6, p. 17, t. 528. *Cantua glomeriflora*, Juss. Ann. Mus. 2, p. 119. *Gilia glomeriflora*, Benth. l. c. G. *multiflora*, Nutt. pl. Gamb. — Borders of W. Texas, New Mexico, Arizona, and adjacent parts of Mexico. Doubtless (as Bentham suspects) not from Buenos Ayres, and hardly yellow-flowered, although Galeotti's specimens seem to be so, and are noted on the ticket: "fl. orangées." And in our district it is probably more than a biennial. G. Don having referred the species to *Collomia*, it may retain the new specific name imposed by him: he supposed the ovules were solitary, and did not notice the obvious inequality in the insertion of the stamens.

9. C. THURBERI, n. sp. Biennis? puberula; caulibus e basi indurata virgatis sesquipedalibus crebre foliosis; inflorescentia spicato-thyrsiformi fere præcedentis; pedunculis pedicellisque brevissimis; calycis lobis tubo subæquilongis; corolla "cærulea vel lilacina" hypocraterimorpha, tubo ultrapollicari sursum sensim parum ampliato lobis orbiculatis calyceque 3 – 4-plo longioribus; filamentis fauci rectæ insertis; antheris brevi-oblongis; ovulis in loculis 8 – 9. *Gilia Thurberi*, Torr. in herb.— New Mexico, near the copper mines, &c., Thurber. Intermediate between the foregoing and the following, with far larger flowers than the former; from their size and abundance apparently very handsome.

10. C. LONGIFLORA. Annua, glaberrima; foliorum segmentis angustissimis elongatis; caule (subpedali ad bipedalem) paniculato-ramoso laxifloro; pedunculis unifloris sæpissime gracilibus subcorymbosis; calycis lobis tubo brevioribus; corolla alba hypocraterimorpha, tubo longissimo (sæpe sesquipollicari), lobis orbiculatis ovatisve (nunc acumine apiculatis); filamentis intra tubum superne haud ampliatum nunc 2 – 3 ad faucem valde inæqualiter insertis; antheris oblongis; ovulis in loculis 10 – 12. *Cantua longiflora*, Torr. Ann. Lyc. *Gilia longiflora*, Don, Benth., &c. — Nebraska to New Mexico, W. Texas, and Arizona; common in pine forests, &c.

* * Folia omnia integerrima: corolla infundibuliformis.

11. C. LEPTALEA, n. sp. Annua, glandulosa vel glaberrima; caule gracillimo (4 – 10-pollicari) effuse paniculato; foliis angusto-linearibus; floribus sparsis filiformi-pedicellatis; corolla alba vel purpurea, tubo tenui e calyce exserto in faucem latam lobis ovatis sublongiorem ampliato; filamentis valde inæqualiter insertis; antheris brevissimis; ovulis in loculis 6. — California, in the Sierra and foot hills, from Plumas to Mariposa County, Bridges, Newberry, Mrs. Davis, Torrey, Bolander, A. Wood; the latter collected a more glandular form, and states that the corolla is "scarlet." Calyx 1 – 2, corolla 5 – 7 lines long. Flowers very loosely panicled; pedicels naked, terminal and opposite the leaves, 3 – 12 lines long, almost capillary.

3. GILIA, Ruiz & Pav.

Corolla infundibuliformis, hypocraterimorpha, nunc fere campanulata vel rotata. Stamina fauci vel tubo nunc sinubus corollæ æqualiter inserta: filamenta sæpissime gracilia, haud declinata, basi fere semper nuda. Ovula in loculis plurima vel pauca, in nonnullis solitaria.

Semina humefacta plerumque (ut *Collomiæ*) mucilaginosa, in omnibus oppositifoliis palmatifidis nec spirillifera. Herbæ, paucæ suffrutices, habitu, variæ. — *Gilia* et *Navarretia*, Ruiz & Pav., Benth. in DC.

Thus regarded, *Gilia* is certainly a polymorphous as well as a large genus; but definite characters are vainly sought for dividing it and for keeping *Navarretia* separate. The most natural separation would seem to be into three genera, characterized mainly by the foliage: — namely, 1. *Gilia*, with alternate and pinnately cut or divided leaves; 2. *Leptodactylon*, frutescent plants, with nearly the corolla of *Phlox*, and alternate palmately parted leaves; and 3. *Leptosiphon*, annuals, with opposite and palmately divided (or entire) leaves. And to this the seeds in some sort answer, — those of the first being mostly mucilaginous and spirilliferous, as in *Collomia*, of the second (always?) unaltered in water, as in *Phlox*, one section of which it externally resembles in foliage; of the third, more or less mucilaginous, but destitute of spiricles; which is paralleled by the one *Collomia*, *C. gracilis*, that tends to have opposite leaves, — points worth noticing by those who accept the doctrine of the derivation of species. But Nuttall's *Siphonella* and a new opposite-leaved *Leptodactylon* nearly efface the distinctions between the latter and *Leptosiphon;* some species of the opposite and palmate series have the upper leaves prevailingly alternate; one of the alternate-leaved series has trisected leaves seemingly of the palmate sort; and a few scattered species of the same series have seeds which produce neither simple mucilaginous tubes nor spiricles when wet. Those of *G.* (*Ipomopsis*) *coronopifolia* differ in this way from those of the nearly related *G. aggregata.* Similarly *G.* (*Linanthus*) *dichotoma* has seeds with a loose arilliform external coat, under which are apparently no mucilage cells or tubuli, while these abound under the closer coat in the nearly related *G. Bigelovii*, as in the other species of that series. It is obviously impracticable, therefore, to restore any of those, at first apparently well-marked genera which Mr. Bentham proposed, and afterwards merged in *Gilia.* To complete our view of the genus I have included the few South American species.

SERIES I. *Palmati-* seu *Oppositifoliæ*, nempe foliis sessilibus palmatisectis (segmentis angustis integerrimis) in perpaucis integris, oppositis vel summis ramealibusque quandoque alternis, in *Leptodactylis* pleris alternis. Semina humefacta tegumento sæpius mucilaginoso sed nunquam spirillifero.

§ 1. DACTYLOPHYLLUM. Corolla campanulata, fere rotata, vel breviter infundibuliformis, lobis obovatis. Filamenta gracilia: antheræ ovales. Ovula in loculis plurima, rarius pauca. Annuæ, pusillæ vel tenues, sæpissime sparsifloræ.

* Flores in dichotomiis subpedicellati. Corolla campanulata, tubo proprio nullo, lobis integerrimis. Folia pleraque tripartita.

1. G. DEMISSA, n. sp. Divaricato-ramosissima, depressa, glabella; foliis rigidulis, segmentis acerosis; calyce fere 5-partito, segmentis inæqualibus lanceolato-subulatis marginibus scariosis, longioribus sæpe foliiformibus corollam albam medio 5-lobam adæquantibus; staminibus inclusis corollæ basi insertis; ovulis in loculis 7. — S. E. California and adjacent part of Arizona, Fremont; mouth of Diamond River, Newberry (*G., Dactylophyllum*, n. sp. in Ives Exped. p. 22); near Fort Mohave, Cooper. Plant 2 – 3 inches high. Flowers somewhat cymosely crowded, the upper internodes being short: pedicels at most a line long, often almost wanting. Corolla 3 lines long.

* * Flores sparsi tenuiter sæpius longissime pedicellati. Corolla aut breviter infundibuliformis aut fere rotata, lobis integerrimis. Folia 3 – 7-secta, superiora sæpius alterna, scabro-hispidula, hirsutula, vel fere glabra. *Gilia* sect. *Dactylophyllum*, Benth.

2. G. LINIFLORA, Benth. Folia *Spergulæ* facie; pedicellis capillaribus; corolla (alba) fere rotata, lobis latis calycem bis terve superantibus; filamentis summo tubo brevissimo insertis basi pubescentibus; ovulis in loculis 6 – 8. — Forma major, *G. liniflora*, Benth., corolla majuscula, lobis lin. 6 – 4 longis. — California.

Var. PHARNACEOIDES (*G. pharnaceoides*, Benth.; Hook. Fl. 2, t.161): minor vel pusilla (*G. tenella*, Nutt. ined.), corollæ lobis 3½ – 2 lin. longis. — California to British Columbia and Rocky Mountains.

3. G. PUSILLA, Benth. Tenella; foliis brevioribus; pedicellis capillaribus; corolla (purpureo tincta seu albida fauce luteola) lobis lato-obovatis fauci subcampanulatæ cum tubo proprio brevissimo æquilongis seu longioribus; filamentis sub sinubus insertis basi fere glabris; ovulis in loculis 3 – 5. — Forma Chilensis, minor, *G. pusilla*, Benth. corolla calyce parum longiore. — Var. CALIFORNICA: corollæ lobis amplioribus calycem bis superantibus. *G. filipes*, Benth. Hartw. p. 325.

4. G. BOLANDERI, n. sp. *G. pusillæ* simillima, differt corolla (cæruleo vel purpureo tincta) tubo angusto calycis tubum cylindraceum subæquante lobis suis fere oblongis cum fauce brevissimo vix ampliata

pl. m. longiore; pedicellis quandoque sesquipollicaribus; ovulis in loculis 2 – 5. — California, Sonoma County, on dry hills; Russian River, Bolander; — Calaveras Valley, A. Wood. Corolla three or four lines long, with comparatively small lobes, not much surpassing the calyx. From the form of the corolla and the length of its cylindrical tube, this cannot be reckoned a variety of *G. pusilla.*

5. G. AUREA, Nutt. Pl. Gamb. p. 155, t. 22. A basi ramosa diffusa 2 – 4-pollicaris; foliis hispidulis brevibus, segmentis angusto-linearibus vix lin. 3 longis; pedicellis subcymosis flore majusculo haud longioribus; corolla sæpius flava, lobis late obovatis patentibus fauci ampliato-infundibuliformi cum tubo brevissimo æquilongis; filamentis prope sinus insertis glabris; ovulis in loculis circiter 10. — California, from Santa Barbara or Los Angeles to Arizona and New Mexico. Corolla rather ampliate-funnelform than campanulate, the border 4 – 6 lines in diameter when expanded, bright or light yellow, sometimes apparently white. — Var. DECORA: corolla alba seu violacea fauce nunc fusco-purpurea. California, Fremont, Brewer, the latter on Monte Diablo.

* * * Flores solitarii paucive ramos terminantes, breviuscule pedicellati. Corolla late breviter infundibuliformis, lobis amplis fimbriolato- seu eroso-dentatis. Filamenta glabra, basim versus corollæ inserta. Ovula numerosa. Folia omnia opposita simplicissima. — *Fenzlia*, Benth. olim. *Gilia* sect. *Dianthoides*, Endl., Benth.

6. G. DIANTHOIDES, Endl. Atakta, t. 29; Hook. Bot. Mag. t. 4876. *G. dianthiflora*, Steud. Nom. *Fenzlia dianthiflora*, Benth. in Bot. Reg. *F. speciosa* & *F. concinna*, Nutt. Pl. Gamb. l. c. — California, from Santa Barbara southward. Flowers variable in size, hue (lilac, purple, or almost white, with yellow or dark purple throat), and in the denticulation of the lobes, which in Coulter's, no. 464, is minute.

§ 2. LINANTHUS, Endl., Benth. Corolla hypocraterimorpha, tubo calycis tubum cylindricum adæquante, lobis late cuneato-obovatis æstivatione valde convolutivis margine obsolete crenulatis vel erosis. Stamina tubo corollæ infra medium inserta, inclusa: filamenta gracilia. Ovula in loculis numerosa (20 – 40). Capsula oblonga vel cylindracea. — Annuæ, erectæ, glaberrimæ; foliis oppositis 3 – 5-sectis, inferioribus sæpe (in pauperrimis nunc omnibus) integris, segmentis lineari-filiformibus; floribus terminalibus alaribusque subsessilibus albis; calycis lobis acerosis. — *Linanthus*, Benth. in Bot. Reg.

7. G. DICHOTOMA, Benth. in DC. cum syn. Spithamæa ad subpedalem, grandiflora; corollæ lobis semi-subpollicaribus; antheris linearibus; seminibus subrotundis, tegumento externo laxo arilliformi albo tenui-reticulato ab interiori multo minore soluto, humefactis nec mucilaginosis. — Common in California.

8. G. BIGELOVII, n. sp. Sæpius tenuior, parviflora; corolla calycis lobos vix superante, limbo tubo suo 2 – 3-plo breviore; antheris ovalibus; seminibus ovalibus, tegumento conformi sub aqua mucilaginoso. — *G. dichotoma*, var. *parviflora*, Torr. Mex. Bound. p. 147. — W. Texas on the Rio Grande and adjacent parts of New Mexico, Bigelow, Wright, to Arizona, Palmer, and Utah, Watson. Leaves sometimes all entire, the upper more commonly trisected. Lobes of the corolla not over two lines in length, cream-white, the outside often reddish.

§ 3. LEPTOSIPHON, Endl., Benth. Corolla hypocraterimorpha, tubo sæpius filiformi elongato, fauce brevissima nunc abrupte plus minus ampliata parum infundibuliformis. Stamina fauci inserta: antheræ breves. Ovula in loculis 6 – 16. — Annuæ, humiles vel tenellæ; foliis oppositis angustis; floribus sæpius parvulis at latis cum bracteis foliiformibus fulcrantibus capitato-glomeratis. (Stylus in diversis stirpibus aut elongatus plus minus exsertus, aut rarius brevis inclusus!) — *Leptosiphon*, Benth. olim.

* *Palmatifoliæ, Genuinæ*, Californicæ, pilosæ; caulibus foliosis; foliis 5 – 7-partitis et in axillis fasciculatis, segmentis angusto-linearibus vel filiformibus. Corolla lobis integerrimis. Filamenta gracilia e fauce pl. m. exserta. Ovula in loculis 6 – 10.

+– *Brevi-Grandifloræ*, validiores; corollæ tubo lobis amplis (semipollicaribus) obovatis parum longiori bracteas villoso-hirsutas raro superante.

9. G. DENSIFLORA, Benth. in DC., cum syn. Prodr. *G. grandiflora*, Benth. l. c. (*Leptosiphon grandiflorus*, Benth. Bot. Reg.): forma tantum, sæpius tenuior, tubo corollæ parum longiori, limbo minori.

+– +– *Tenuifloræ*, graciliores, sæpius tenellæ; corollæ tubo lobis (1½ – 4 lineas tantum longis) ovalibus ovatisve 3 – 6-plo longiori. (Species difficillimæ, an confluentes?)

10. G. ANDROSACEA, Steud., Benth. Multicaulis; corollæ (haud flavæ) tubo e bracteis hirsuto- seu villoso-ciliatis longe exserto circa pollicem longo lobis triplo longiori.

Var. DETONSA. Subglabra; bracteis foliisque parum hispidulo-ciliatis. — California, Bridges, Brewer. Nevada near Carson City, Anderson, a somewhat intermediate form.

11. G. MICRANTHA, Steud., Benth. Gracilis; corollæ tubo pertenui (sub-sesquipollicari lobis (lin. 2 – 3 longis) multoties longiori; bracteis foliisque floralibus molliter breviter pubescentibus. — *Leptosiphon parviflorus* & *luteus*, Benth. Bot. Reg. *L. parviflorus* var. *rosaceus*, Hook. f. Bot. Mag. t. 5863 (*Gilia longituba*, Benth. Pl. Hartw.): forma spectabilis corolla majuscula læte rosea. — Corolla lutea, albida, nunc lilacina vel rosea, nunc aurea (var. *aurea*, Benth. l. c.).

12. G. TENELLA, Benth. Pl. Hartw. Depressa, parvula; corollæ tubo minus attenuato lin. 6 – 9 longo, lobis sesquilineam longis (roseis lilacinisve fauce lutea); bracteis etc. hispidulo-ciliatis. *L. bicolor*, Nutt. Pl. Gamb. l. c. chiefly. — The most northern in range, from Santa Barbara to Puget Sound. Has been confounded with the preceding.

13. G. CILIATA, Benth. l. c. Rigidior, hirto-pubescens, 3 – 12-pollicaris; corollæ tubo (lin. 6 – 7 longo) ultra bracteas hirsutissimo-ciliatas vix exserto, lobis sesquilineam longis; calycis lobis acerosis. — N. California to the borders of Nevada.

* * *Simplicifoliæ*, glaberrimæ, pygmeæ; internodio infra capitulum nunc prolifer unico; foliis bracteisve ovato- nunc subangusto-lanceolatis. Corollæ lobis cuneatis margine repando vel 1 – 3-dentato. Antheræ fauce inclusæ sessiles. Ovula in loculis 10 – 16.

14. G. NUDICAULIS. *Collomia nudicaulis*, Hook. & Arn. Bot. Beech. — S. E. Oregon, Tolmie. Nevada, &c., Anderson, Stretch, Watson. South Park, Colorado, E. Hall, a diminutive form. There are no leaves from the persistent oval cotyledons up to the head, from half an inch to three inches. Corolla white, pink, or yellow, the exserted tube three or four lines long.

§ 4. SIPHONELLA. *Leptosiphon* referens, sed corollæ tubus calycem haud superans, faux magis infundibuliformi-ampliata, ovula in loculis pauca, flores minus congesti. — Perennes basi nunc suffrutescente, pube minuta molli subcinerea. Calyx cylindraceus, firmus, striatulus, mox 5-partitus, lobis lanceolato-subulatis, marginibus crassiusculis sinubusque haud membranaceis vel scariosis.

Corolla alba fauce flava, tubo extus puberulo, lobis obovatis. Filamenta brevia e fauce subexserta: antheræ ovali-oblongæ. — *Siphonella*, Nutt. in herb.

15. G. Nuttallii, n. sp. Spithamæa ad pedalem; caulibus e basi suffrutescente plurimis simpliciusculis; foliis 3 – 7-partitis internodio sæpius brevioribus, segmentis angusto-linearibus mucronatis (lin. 6 – 9 longis); floribus in glomerulum foliosum confertis; ovulis in loculis binis. — *Siphonella montana* & *S. parviflora*, Nutt. herb. — Rocky Mountains of Colorado and Utah to the Sierra Nevada in California, Nuttall, Fremont, Anderson, Brewer, Watson. — Tube of corolla four or five, the lobes two or three lines long.

16. G. floribunda, n. sp. Ultrapedalis; caulibus e basi frutescente ramosis gracilibus; foliorum segmentis fere acicularibus internodia sæpius adæquantibus; floribus laxiuscule corymboso-cymosis, nonnullis pedicellatis; ovulis in loculis 4: cæt. fere præcedentis. — California, probably on S. E. borders, Coulter, no. 454. Lower California 50 miles S. of San Diego, E. W. Morse, 1866, ex A. Wood. Pine woods of Arizona, Coues and Palmer, 1865. — Flowers "delicate-scented," rather larger and much more numerous than those of *G. Nuttallii* (some forms of which nearly approach it), either densely or loosely cymose-clustered at the extremity of copious paniculate or corymbose branchlets.

§ 5. LEPTODACTYLON, Benth. Corolla hypocraterimorpha, tubo e calyce demum pl. m. exserto, fauce subinfundibuliformi-ampliata. Stamina fauci vel infra faucem inserta: filamenta brevia vel brevissima: antheræ breves inclusæ. Ovula in loculis plurima. Semina tegumento conformi, humefacta nec mucilaginosa nec spirillifera! — Perennes, suffruticosæ, nunc cæspitosæ, foliosissimæ; foliis alternis vel in unica oppositis et in axillis fasciculatis palmatipartitis, segmentis integerrimis cum calycis lobis acerosis subulatisve pungentibus; floribus roseis lilacinis albisve concinnis aut cymuloso-confertis aut solitariis ramulos breves terminantibus sessilibus. — *Leptodactylon*, Hook. & Arn.

* Folia in caulibus brevibus fere herbaceis opposita!

17. G. Watsoni, n. sp. Hirtello-scabrida, subglandulosa, nunc glabrata; caulibus gracilibus (circ. spithamæis) fere herbaceis e caudice lignescente crasso; foliis 3 – 5-partitis patentissimis, segmentis tenui-acerosis internodiis sæpe brevioribus; calycis lobis tubo dimidio brevi-

oribus; corolla alba fauce subpurpurea; antheris faucialibus; ovulis in loculis circa 10. — Wasatch Mountains, Utah, Watson. Tube of the corolla and lobes each half an inch long. Connects *Leptodactylon* intimately with the two preceding sections of *Gilia.*

* * Folia omnia alterna, rigidiora, et in axillis crebre fasciculata. Suffrutices.

18. G. Californica, Benth. in DC. Ramis foliisque creberrimis mox patentissimis primum laxe tomentoso-pubescentibus; corollæ roseæ seu lilacinæ lobis amplis late cuneato-obovatis sæpe erosulis; antheris lineari-oblongis infra faucem; ovulis in quoque loculo 20–25. *Leptodactylon Californicum,* Hook. & Arn. Bot. Beech. p. 369, t. 89, Bot. Mag. t. 4872. — California south to San Bernadino. Limb of the showy corolla an inch and a half in diameter.

19. G. pungens, Benth. l. c. Viscido-pubescens, puberula, vel glabrata; foliis plerumque erectiusculis vel strictis; corollæ roseæ albidæ seu flavidæ lobis fere dimidio minoribus sæpius angustioribus; antheris faucialibus oblongis; ovulis in quoque loculo 8–10. *G. pungens* & *G. Hookeri,* Benth. l. c., cum syn. — Plains of the upper Platte and Columbia to E. California and Arizona. Very variable: the original *Cantua pungens,* Torr., from the Platte, is a low and minutely pubescent or nearly glabrous form. — Var. cæspitosa (*Leptodactylon cæspitosum,* Nutt. Pl. Gamb.): pulvinato-depressa, glabrescens, subherbacea. Upper Platte. — Var. Hookeri (*Phlox Hookeri,* Dougl. in Hook. Fl. t. 159): forma elatior viscido-pubens, foliis in ramis floridis nunc sparsioribus. The flowers not found of "bright yellow" color, as noted by Douglas. — Var. squarrosa: segmentis foliorum subulatis validioribus patentibus vel squarroso-recurvis. Arid districts of Nevada and Utah, coll. Anderson, Watson, &c.

Series II. *Pinnati-Alternifoliæ,* nempe foliis pinnatisectis lobatis dentatisve rarissime integerrimis. Semina humefacta tegumento mucilaginoso tubulos spirilliferos porrigente (no. 44, 47, 48, 59, 60, exceptis).

§ 6. NAVARRETIA. Flores capitato-glomerati, crebre foliaceo-bracteati. Calycis lobi, uti bractearum, rigidi, acerosi, spinulosi nunc laciniati, nunc inæquales. Corolla tubuloso-subinfundibuliformis, gracilis, lobis parvulis oblongis. Stamina sub fauce inserta: antheræ breves. Ovarium quandoque dimerum. Annuæ, fere semper Californicæ, sæpius viscidæ, nunquam albo-lanatæ, foliis

1 – 2-pinnatifidis incisisve, lobis plerumque pungentibus. Bracteæ in nonnullis palmatifidæ. (Semina humefacta tubulis cellulisve spirilliferis minus elongatis.) — *Navarretia*, Ruiz & Pav., Benth. *Ægochloa*, Benth. olim.

* Folia nonnulla plus minus bipinnatifida vel incisa: stamina fauce corollæ violaceæ inclusa, sæpius inæquilonga, vix inæqualiter inserta: ovula in loculis 8 – 12. Herba viscida, fœtida.

20. G. SQUARROSA, Hook. & Arn. Bot. Beech. p. 151. (*Hoitzia squarrosa*, Eschsch.) *G. pungens*, Hook. Bot. Mag. t. 2977. *Navarretia*, Hook. & Arn. *squarrosa*, Hook. & Arn. l. c. p. 368; Benth. cum. syn. Prodr.

* * Folia plera vel nonnulla bipinnatifida vel incisa: stamina e fauce exserta: ovula in loculis 1 – 4.

+ Rigida, validior, 5 – 12-pollicaris.

21. G. COTULÆFOLIA, Steud. *Navarretia pubescens* et *cotulæfolia*, Benth.: the former more pubescent; the latter as commonly with cells uniovulate, even in original specimens; both sometimes biovulate. The name here retained is the better one; moreover, the herbage is said by Professor Brewer to exhale the odor of *Maruta Cotula.*

+ + Graciliores vel demissæ.

22. G. INTERTEXTA, Steud. Erecta, nunc patenti-ramosa, nec viscida nec glandulosa, pube alba in caule subrobusto (3 – 7-pollicari) retrorsa hirsuta; foliis glabratis, segmentis aceroso-spinescentibus divaricatis simpliciusculis; floribus arcte glomeratis; calycis tubo cum basi bractearum albo-hirsutissimo, lobis corollam albam adæquantibus; ovulis seminibusque in loculis 3 – 4. — *Navarretia intertexta*, Hook. Fl. p. 75. — Columbia River to Northern California and the Rocky Mountains.

23. G. MINIMA. Depressa, subpollicaris, nunc cæspitans, glabrata; foliis minus divisis acicularibus; calycis tubo glabello sinubus latis tantum albo-piloso lobis inæqualibus (corollam albam subæquantibus) æquilongo; ovulis in loculis 1 – 3. — *Nav. minima*, Nutt. Pl. Gamb. p. 160. — Arid interior of Oregon and Nevada to Colorado (Nicollet, Geyer, Vasey, &c.).

24. G. BREWERI, n. sp. Erecta, nunc diffuso-ramosissima, 1 – 6-pollicaris, undique minutissime glanduloso-pubera; segmentis foliorum subsimplicibus aciculari-subulatis; floribus minus glomeratis; calycis lobis conformibus angusto-subulatis tubo suo (capsulam breviore) 3 –

4-plo longioribus corollam flavam (lin. 3 – 4 longam) adæquantibus; ovulis in loculis 1 – 3. — Sierra Nevada, at Ebbett's and Amador Pass, alt. 8,000 feet, Brewer. From the W. Humboldt Mountains, Nevada, to the Wasatch, 6 – 9,000 feet, S. Watson.

25. G. LEUCOCEPHALA. Gracilis, 3 – 6-pollicaris, haud glandulosa; ramis infra capitulum densum retrorsim pubescentibus; foliis subflaccidis glabris, segmentis filiformibus sæpius indivisis, floralibus etiam vix pungentibus; calycis tubo sinubus saltem villoso-pubescente; corolla alba (lin. 4 longa) calycem superante, lobis staminibus sæpius brevioribus; ovulis in loculis 2. — *Navarretia leucocephala*, Benth. Pl. Hartw. p. 324. — California, chiefly on the Sacramento and its tributaries.

26. G. NAVARRETIA, Steud., *Nav. involucrata*, Ruiz & Pav., the original and only Chilian species, appears to be nearer *G. leucocephala* than to *G. cotulæfolia;* but in fact the three species approach each other too nearly.

* * * Folia semel pinnatifida vel incisa, paucave fere integerrima: stamina e fauce corollæ violaceo-purpureæ nunc albæ vel luteolæ pl. m. exserta: calycis lobi integerrimi vel in *G. viscidula* rariter laciniati.

+ Gracillimæ, ramis foliisque paucisectis filiformibus: bracteæ fere palmatipartitæ.

27. G. FILICAULIS, Torr. in herb. Erecta, spithamæa, superne minutissime glandulosa; ramis tenellis pedunculiformibus effuse paniculatis; foliorum segmentis rhachique subsetaceis; corollæ violaceæ tubo tenero calycis lobos lanceolato-subulatos parum pungentes longe superante; ovarii loculis uni-(raro bi-?) ovulatis. — California, Jeffray, no. 1474, in herb. Kew. Also Bear Mountain, Mariposa County, Torrey. Leaves sparse. Heads small, rather naked. Flowers nearly three lines in length, exceeding the palmately few-cleft inner bracts.

28. G. DIVARICATA, Torr. in herb. Diffusa, nunc patentissima, 3 – 6-pollicaris, superne viscidulo-pubescens, ramis proliferis pedunculiformibus; foliorum segmentis rhachique subulato-filiformibus, bractearum magis pungentibus; corollæ purpureæ vel luteolæ tubo infundibuliformi calycis lobis setaceo-subulatis pungentibus parum longiore; ovarii loculis 5 – 7-ovulatis. — California, along the foot hills of the Sierra Nevada, coll. Shelton, Rattan, Bolander, Torrey, Mrs. Davis, C. Lee. — Flower from three to five lines long.

+— +— Validiores, viscidæ; foliis rigidis superioribus præsertim a basi dilatatis, lobis dentibusve spinulosis vel spinosis: capitulis densis.

29. G. VISCIDULA. *Nav. viscidula*, Benth. Pl. Hartw.— Apparently common and widely spread in California. The lobes of the calyx more usually entire. It is described as with solitary ovules in the cells; but two are more commonly found, even in Hartweg's specimens; while in robust forms of what is otherwise indistinguishable from the species, collected by Bridges, Fitch, Samuels, Bolander, &c., there are three or four ovules in each cell!

30. G. ATRACTYLOIDES. *Nav. atractyloides*, Hook. & Arn. — California, from Monterey to San Diego.

+— +— +— Depressæ, parum viscidæ; foliis rigidis versus apicem dilatatis, dentibus lobisve cum calycis segmentis longe setiferis; floribus vix congestis.

31. G. SETOSISSIMA. *Navarretia setosissima*, Torr. & Gray, Bot. Ives Colorado Exped. p. 22. Ovula in loculis 6 – 10. — Var. EXIGUA, ovulis in loculis 3 – 5. *N. Schottii*, Torr. Bot. Mex. Bound. p. 145. — Arizona and S. E. California on the Mohave, &c., Coulter, Fremont, Newberry, Schott, Cooper.

§ 7. HUGELIA. Flores capitato-glomerati, crebre foliaceo-bracteati; bracteis 3 – 5-fidis basi calycibusque lana longa implexa albida vestitis, lobis utriusque acerosis subulatisve cuspidatis. Corolla plerumque cærulea hypocraterimorpha, tubo gracili, lobis sæpius oblongis. Antheræ exsertæ, nunc lineari-sagittatæ, nunc breves. Ovula numero perquam variabilia! — Plantæ humiles, juniora præsertim floccoso-lanatæ, haud viscidæ, foliis semel pinnatipartitis paucisve integris acerosis vel subulato-filiformibus. — *Hugelia*, Benth. in Bot. Reg. *Gilia* sect. *Collomioides* (Endl.) & *Pseudo-collomia*, Benth. in DC.

In this group I can make nothing of the number of the ovules, even as a specific character. In two specimens apparently exactly alike, one has three or four, the other only two, ovules in each cell: sometimes there is a pair in one or two of the cells, and a solitary one in the other. In none have I detected the maximum number mentioned in the Prodromus, i. e. ten in each cell. The *Hugelia lutea*, Benth., probably had not yellow flowers. The tube of the corolla lengthens with age in all the species. *Gilia gossypifera* is better placed in the next section.

* Perennis, caulibus rigidis e basi suffruticosa: antheræ lineari-sagittatæ.

32. G. DENSIFOLIA, Benth. G. (olim *Hugelia*) *densifolia* & *elongata*, Benth. l. c. — No other specimens of *G. densifolia* have been found exactly answering to those of Douglas; these have 5 – 7 (according to Bentham about 10) ovules in each cell, those of *G. elongata* only two or three. Specimens collected by Xantus at Fort Tejon, and by Dr. Cooper on the Mohave, are as near as may be intermediate.

* * Annuæ, graciliores, demum paniculato-ramosæ, foliis segmentisve sæpius paucis filiformibus.

33. G. VIRGATA, Steud., Benth. l. c. Primum stricticaulis, simplex; antheris (in sicco) linearibus sagittatis lineam longis. — *Hugelia virgata*, Benth., Hook. Ic. t. 200 (anthers figured too short). The ordinary form has most of the cauline leaves entire, and the upper of few divisions. Lobes of the corolla three lines long.

Var. FLORIBUNDA: corymboso-ramosa; capitulis majoribus multifloris; foliis magis dissectis. — California, Fitch, Wallace, Brewer. Ovules vary from two to five in each cell.

34. G. FLOCCOSA. Gracilior, spithamæa, demum diffusa paniculata; antheris lineari-oblongis vix semilineam excedentibus; floribus minoribus; ovarii loculis nunc uni- nunc bi-rarius 3 – 4-ovulatis. — *Hugelia lutea*, Benth. in Bot. Reg. *Gilia* (*Pseudocollomia*, Benth.) *lutescens*, Steud., Benth. in DC. — California to Arizona, interior of Oregon, and Utah. Flowers blue or pale purple, becoming white only in age, and though appearing yellowish in original dried specimens of Douglas, probably never yellow. Hence a new specific name is required. Nuttall has an unpublished *Hugelia floccosa* in his herbarium, but with no flowers developed; and, as it is either this or the next, the name may be applied to the present species.

35. G. FILIFOLIA, Nutt. Gamb. p. 156. Gracilis, spithamæa et ultra, rigidula; foliis plerisque tripartitis; antheris ovalibus minimis; corollæ tubo parum exserto; ovarii loculis sæpius 4 – 6-ovulatis. — Santa Barbara and San Isabel, California, Nuttall, Thurber; and Fort Mohave, Cooper.

Var. DIFFUSA: laxa, nunc ramosissima. — Fort Mohave and Nevada to New Mexico and the borders of Texas. Lobes of the pale purple or blue corolla only one or two lines long: anthers only a quarter or one third of a line in length. Forms of this approach the preceding too nearly.

(G. LANATA, Lindl. Jour. Lond. Hort. Soc. 3, p. 74, said to come from Mexico, of which I know only the character, is probably a form of *G. virgata* or of *G. filifolia.*)

§ 8. ELAPHOCERA, Nutt. Flores capitato-congesti, bracteati, raro cymoso-laxiusculi. Corolla (alba) hypocrateriformis, tubo calycis lobos sæpius mucronato- vel cuspidato-apiculatos (haud pungentes) adæquante vel paullo (rarius duplo) superante. Stamina corollæ lobis ovalibus oblongisve plus minus breviora, sinubus sæpius inserta. — Herbæ biennes vel perennes vitæ ut videtur brevis, nunc annuæ, humiles; caulibus fere semper lanoso-pubescentibus; calycibus bracteisque pilis longis viscidulis multiarticulatis crinitis; foliis semel pinnatifidis vel integris.

* Folia integerrima angustissima: flores capitato-congesti: filamenta gracilia, exserta, sed corollæ lobis breviora.

36. G. WRIGHTII, n. sp. Caulibus virgatis rigidis circa pedalibus e basi lignescente seu radice forte perenni? usque ad apicem foliosis; foliis rigidis cuspidato-mucronatis; bracteis lato-lanceolatis hinc inde laciniatis cum calycis lobis subulatis aristato-cuspidatis ciliatis; corollæ lobis oblongis tubo parum exserto (lin. 4 longo) dimidio brevioribus; antheris brevi-oblongis; ovulis in loculis 3 – 4. — Western frontiers of Texas, on the Rio Grande forty or fifty miles below El Paso, C. Wright, no. 496. In habit like a *Hugelia:* flowers white or faintly bluish.

37. G. GUNNISONI, Torr. & Gray, Pacif. R. R. 2, p. 129, t. 9. Annua, subglabra, sparsifolia, laxe paniculato-ramoso, ramis capitulo parvo quasi pedunculato terminatis; ovulis in loculis 2 – 3. — The figure is characteristic. We have it only from Green River, Utah, Kreusfeldt, and San Juan, New Mexico, Newberry. The plants referred to in Bot. Mex. Boundary are different: Wright's 1642 is *G. filifolia* var. *diffusa.*

* * Folia aut omnia aut nonnulla in lobos paucos angusto-lineares partita, raro omnia integra: filamenta corollæ lobis breviora: flores arcte capitato-glomerata. — Herbæ biennes vel perennes, caudice vel radice dura.

38. G. SPICATA, Nutt. Pl. Gamb. l. c. Caulibus validis erectis (4 – 10-poll.) superne capitula plurima in spicam longe virgatam interruptam foliosam congesta gerentibus; foliis nunc trifidis nunc integerrimis cum calycis lobis fere muticis; corollæ lobis oblongo-ovatis tubo vix exserto breviore; antheris fauce subsessilibus; ovulis in loculis

4–6.— Benth. Kew Jour. 3, p. 290. *G. spicata* & *G. trifida*, Nutt. l. c. Rocky Mountains, Colorado, Nuttall, Fremont, Geyer, Parry, Hall & Harbour. — Var. CAPITATA : forma minor, foliis integerrimis, floribus in capitulo unico terminali. Rocky Mountains, Hall & Harbour, no. 461.

39. G. CONGESTA, Hook. Caulibus erectis vel diffusis (3–12-poll.) e basi subcæspitosa ; capitulis florum solitariis vel paucis corymbosis densis ; foliis 3–7-partitis paucisve integerrimis, lobis ut calycis aristulato-mucronatis ; corollæ lobis ovalibus tubo suo haud exserto vix brevioribus ; filamentis sinubus insertis antheras adæquantibus vel excedentibus ; ovulis in loculis 2–4.— Hook. Fl. & Ic. t. 235. Colorado and Nebraska, to Oregon and California in the Sierra Nevada.

Var. CREBRIFOLIA. Depressa ; caulibus (2–3-pollicaribus) foliosissimis monocephalis ; foliis aceroso-subulatis integris parvis (lin. 3–6 longis).— *G. crebrifolia*, Nutt. Pl. Gamb. l. c.— Rocky Mountains, on Big Sandy River, Colorado, Nuttall. Specimens from Bear River Valley, Utah, Watson, connect this with *G. congesta.*

40. G. IBERIDIFOLIA, Benth. Kew Jour. 3, p. 290. Præcedenti peraffinis ; foliis rigidioribus bracteisque cuspide validiore mucronatis ; capitulis corymbosis laxioribus ; filamentis brevioribus ; ovulis in loculis solitariis ! — Scott's Bluffs, North Platte, Nebraska, Geyer ; and Blackwater of the same, H. Engelmann. Not elsewhere met with. Perhaps a form of *G. congesta.*

* * * Folia omnia vel plera pinnatifida vel trifida : flores conferte cymulosi demum laxiusculi, folioso-bracteati : calycis lobi cum bracteæ aristulato-cuspidati. Annuæ, humiles, e basi ramosæ.

41. G. GOSSYPIFERA, Gillies, ex Benth. in Prodr., of the Andes of Mendoza, is evidently of this section, and most like the following.

42. G. PUMILA, Nutt. Pl. Gamb. (1849). Caulibus laxe lanosis foliosis ; foliis angusto-linearibus integris vel in lobos 2–5 lineares divergentes partitis ; corollæ tubo (lin. 3–4 longo) gracili lobis suis 3–4-plo calycis lobis duplo longioribus ; filamentis gracilibus sinubus insertis corollæ lobis parum brevioribus ; ovulis in loculis 5–6.— *G. trifida*, Benth. Kew Jour. l. c. Western borders of Texas and New Mexico, Fendler, Wright, Bigelow, &c., to the Platte, Nuttall, Geyer, and Utah, S. Watson.

43. G. POLYCLADON, Torr. Bot. Mex. Bound. Caulibus diffusis subnudis parce pubescentibus vel puberulis ; foliis pinnatifidis incisisve, lobis brevibus oblongis abrupte spinuloso-mucronatis, floralibus flores

superantibus; corollæ tubo (sesquilineari) calycem vix superante; limbo parvo; antheris fauci insertis subsessilibus; ovulis in loculis 2. — New Mexico and western frontiers of Texas, Wright, Bigelow, to Utah, S. Watson.

§ 9. IPOMOPSIS, Benth, pro parte. Flores thyrsoideo-paniculati, parum bracteati. Corolla (plerumque coccinea) tubuloso-infundibuliformis, tubo sensim sursum ampliato calycis lobos subulatos suosque lobos ovatos seu lanceolatos patentes multum superante. Stamina fauci corollæ vel sub sinubus inserta, lobis haud longiora. Ovula in loculis plurima. — Biennes, glabellæ seu pilosulæ; caulibus elongatis; foliis semel pinnatifidis; floribus speciosis. *Ipomopsis*, Michx. *Ipomeria*, Nutt.

I confine this group to the original species and two others nearly related to it. As arranged by Bentham it comprised two or three here referred to *Eugilia*. As to *G. longiflora* and *G. glomeruliflora*, they prove to have very unequally inserted stamens, which is the sole character of *Collomia*. The tendency to dimorphism, of which there are traces, or perhaps rather incipient manifestations, in various portions of the genus, is most marked in *G. aggregata*. The included stamens of *G. subunda* perhaps belong to the short-stamened form of the species, but no other is known.

* Caules alte foliosi, foliis pinnatipartitis, segmentis filiformibus seu angusto-linearibus.

44. G. CORONOPIFOLIA, Pers., Benth. cum syn. Prodr., et *G. Floridana*, Don, & *G. Beyrichiana*, Bouché. Elata; thyrso virgato compacto; corollæ lobis ovatis subpatentibus filamentis parum longioribus; seminibus humefactis nec mucilaginosis nec spirilliferis! tegumento externo laxo et grossius et tenuissime reticulato. — South Carolina to Florida and Texas.

45. G. AGGREGATA, Spreng., Torr. Bi–quadripedalis, versus paniculam laxam sæpe ramosam nudiuscula; floribus suaveolentibus; calyce sæpissime glanduloso, lobis subulatis; corollæ tubo angusto, lobis ovatis seu lanceolatis acutis patentissimis mox recurvis; filamentis aut e tubo exsertis aut inclusis; seminibus mucilaginosis et spirilliferis modo generis. — *G. aggregata* (*Cantua*, Pursh!) & *G. pulchella* (Dougl.), Benth. cum syn. Prodr. — From Upper Platte and Missouri to the Columbia and the Pacific, and south to Arizona. The original *Cantua aggregata* is one of the forms with long and narrow calyx-lobes. The opposite extreme is —

Var. BRIDGESII: calycis lobis lato-subulatis immo deltoideis; caulibus sesquipedalibus laxis parce foliatis; laciniis foliorum obtusissimis; floribus parcis. — California, Bridges, &c.

* * Caules subpedales superne nudi, foliis subpinnatifidis.

46. G. SUBNUDA, Torr. in herb. Glanduloso-puberula; foliis ad basin caulis superne aphylli laxe ramosi confertis spathulatis oblongisve (pollicaribus) breviter inciso-lobatis; floribus paucis subconfertis; corollæ coccineæ vel aurantiacæ tubo semipollicari lobis ovatis obtusis triplo longiore; antheris subsessilibus fauce inclusis. — Nevada and Arizona or New Mexico, Newberry, Stretch, Palmer.

§ 10. GILIANDRA. Flores thyrsoideo-paniculati. *Ipomopsidis.* Corolla (alba vel subcærulea) hypocraterimorpha, tubo calycem subduplo superante lobis suis obovatis parum longiore. Filamenta sub sinubus inserta, longe (ultra corollæ lobos) exserta: antheræ ovatæ. Ovula in loculis 6 – 8. Semina nec mucilaginosa nec spirillifera! — Biennes, glanduloso-puberula, foliis semel pinnatifidis, floribus parvulis.

47. G. STENOTHYRSA, n. sp. Caule e radice crassa erecto (spithamæo ad subpedalem) simplici valido usque ad thyrsum virgatum racemiformem folioso; foliis floralibus bracteisque parvulis integerrimis, cæteris in lobos breves oblongos pinnatifidis. — Utah, in a "cedar forest," Uintah Mountains, Fremont. Corolla, half an inch long, apparently white.

48. G. PINNATIFIDA, Nutt. in herb.; Gray Enum. Pl. Parry. Spithamæa ad sesquipedalem, inferne glabrata; panicula composita laxe ramosa; foliis in lobos lineares vel angusto-oblongos rariter 1 – 2-lobatos pinnatipartitis; bracteis linearibus subulatisve parcis; staminibus longe exsertis. — N. New Mexico and Colorado to Snake River, &c., in or near the Rocky Mountains, Nuttall, Fendler, and various collectors. A part of Geyer's 42 and 25, referred to *G. inconspicua*, belongs here. Tube and lobes of the corolla each about two lines, the much exserted stamens three lines long. Seeds with a close coat, wholly unchanged when wetted.

§ 11. MICROGILIA, Benth. in DC. Flores secus ramos graciles laxe spicatim vel paniculatim dissiti. Calyx brevi-campanulatus, 5-dentatus. Corolla (alba) hypocraterimorpha, tubo e calyce paullo exserto lobis duplo longiore. Stamina tubo inserta, inclusa: antheræ brevissimæ. Ovula in loculis solitaria! — Annuæ, subglabræ, ramosissimæ; foliis fere filiformibus seu ramealibus tenui-subulatis integerrimis caulinisve tripartitis, floribus minimis.

49. G. MINUTIFLORA, Benth. l. c. Rigidula, subscoparia, 1–2-pedalis; foliis caulinis nonnullis 3-partitis, ramealibus subulatis; floribus terminalibus sæpeque secus ramulos strictos quasi spicatis; corollæ (lin. vix 2 longæ) tubo angusto lobis suis calyceque duplo longiore; filamentis gracilibus; capsula ellipsoidea (lin. 2 longa); semine oblongo. — *Collomia* (*Picracolla*) *linoides*, Nutt. Pl. Gamb. p. 159. — Interior of Oregon (not "California"), Douglas; Colorado and Wyoming, on the Upper Platte, Nuttall, Fremont.

50. G. TENERRIMA, n. sp. Effuse ramosissima, humilis; ramis ramulisque filiformibus; foliis brevibus integris; floribus laxe paniculatis minutis; pedicellis tenuibus divaricatis; capsula subglobosa (vix lineam longa); semine ovoideo. — Utah, on hills above Bear River, near Evanston, Watson in C. King's expedition.

§ 12. EUGILIA. Flores paniculati, sparsi, vel in prioribus capitato-glomerati, sæpius ebracteati. Corolla (cærulea, purpurea, vel alba) infundibuliformis, seu in ultimis fere campanulata vel rotata. Filamenta gracilia, ad vel prope sinus corollæ inserta, lobos haud superantia. Ovula in loculis pauca vel plurima. — Folia pinnato-incisa vel dissecta. — *Gilia* sect. *Eugilia* cum spec. *Ipomopsidis* nonnullis, Benth.

* Flores in cymam capituliformem longe pedunculatam digesti. Stamina sinubus ipsis corollæ brevis inserta, lobis æquilonga. Ovula plurima. — Annuæ, Californicæ, erectæ; foliis 2–3-pinnatipartitis, segmentis angustissimis; corollis sæpius cæruleis.

51. G. CAPITATA, Dougl. Corollæ lobis lineari-lanceolatis, fauce parum ampliata; calyce sæpius glabro.

52. G. ACHILLEÆFOLIA, Benth. Flores majores; corollæ lobis obovatis late oblongisve fauce abrupte insigniter ampliata; calyce pl. m. lanoso.

* * Flores in prioribus subcongesti, in cæteris laxe paniculati vel dissiti. Corolla infundibuliformis fauce plus minus ampliata. Seminis testa spirillifera modo generis. Annuæ, humiliores, nunc diffusæ.

+ Pluriovulatæ.

53. G. MULTICAULIS, Benth. cum syn. Prodr. *G. stricta*, Scheele in Linnæa, 21, p. 755? *G. millefoliata*, Fisch. & Meyer: forma diffusa

foliosa parviflora. (Calyx-teeth in char. "tubo suo duplo brevioribus," not "longioribus" as in Prodr.) — Var. TENERA: forma depauperata exili, pedunculo sæpe unifloro. *G. stricta*, Liebm. Ind. Hort. Hafn. 1853, ex char. California. To this, or perhaps to the preceding species, may probably belong *Polemonium capitatum*, Esch. Mem. Acad. Petrop.

54. G. LACINIATA, Ruiz & Pav.: known from the smaller and sparser-flowered forms of the preceding by its oblong capsule. Chili, &c.

55. G. TRICOLOR, Benth. One form has a glabrous calyx, &c. California.

56. G. TENUIFLORA, Benth., Lindl. Bot. Reg. &c., 1888. California, not common. — Var. LATIFLORA. Corollæ tubo calyce aut paullo aut duplo longiore, fauce lobisque amplioribus. Los Angeles County? Fremont, Wallace.

57. G. INCONSPICUA, Dougl. — Columbia River to the Platte and Arizona. The corolla is not hypocrateriform, as described and figured in Bot. Mag. t. 2883, at least when fully developed. It is usually ampler; and to the species (which is a widely variable one) I must refer back *G. sinuata*, Dougl., Benth. in DC., the flowers of which sometimes attain thrice the size, and nearly connect with the var. *latiflora* of the preceding! *G. arenaria*, Benth. (collected on the sea-beach at Monterey by Rich and Parry), is a glandular-viscid form, with more slender corolla (half an inch long), which is likely to pass into *G. tenuiflora.* — Geyer's no. 25 and 42, referred to *G. inconspicua* by Hooker, is partly of that species, partly *G. pinnatifida.*

+− +− Pauci- (in loculis 2-3-) ovulatæ.

58. G. CRASSIFOLIA, Benth. Chili, &c. Near *G. inconspicua.*

* * * Flores effuse paniculati, longius pedicellati, minimi. Corolla tenui-infundibuliformis vel subcampanulata (alba seu albida): stamina juxta sinus inserta, lobis breviora. Ovula numerosa. Semina humectata mucilagine spirillisque destituta! — Annuæ, pusillæ, e basi ramosissimæ, foliis radicalibus semel pinnatifidis vel incisis.

59. G. LEPTOMERIA, n. sp. Parum glandulosa, floribunda; foliis radicalibus spathulatis seu lanceolatis leviter pinnatilobatis, caulinis fere integris linearibus, ramealibus bracteisve minimis; pedicellis erectis flore longioribus seu brevioribus; corolla angusto-infundibuliformi sesquilineari demum elongata (ad lineas 3) fere hypocrateri-

morpha, tubo calyce lobis suisque ovatis duplo longiore; ovulis in loculis plurimis (seminibus $\frac{1}{32}$ unc. longis). — Mountain valleys of Nevada and Utah, S. Watson. Resembles some most depauperate and small-flowered forms of *G. inconspicua;* yet well marked by the narrow corolla and especially by the seeds.

60. G. MICROMERIA, n. sp. Fere glabra, tenella, laxa; foliis inferioribus pinnatifidis lobis oblongis obtusis divaricatis, cæteris linearibus integerrimis; floribus sparsis; pedicellis filiformibus elongatis patentibus demum recurvis; corolla oblongo-campanulata lineam longa calycem parum superante, lobis brevibus; ovulis in loculis vix ultra 6; capsula subglobosa stylo longiore. — Mountain valleys of Nevada and Utah, S. Watson. Seeds as in the preceding.

* * * * Flores sparsi longius pedicellati, sat magni. Corolla aut campanulata aut rotata. Calycis lobi lanceolato-subulati, tubo suo longiores. Antheræ sæpius oblongæ. Humiles seu gracilescentes, diffusæ.

+— Annuæ, floribus parvulis.

++ Corolla campanulata.

61. G. CAMPANULATA, n. sp. Parum viscidulo-pubens, 2–3-pollicaris; ramis patentibus; foliis inferioribus lanceolatis parce pinnatifido-dentatis, ramealibus lineari-lanceolatis sæpe integerrimis; pedicellis flore interdum brevioribus; corolla campanulata (alba?) calyce duplo longiore leviter 5-loba; staminibus basi latæ corolla insertis inclusis; ovulis in loculis 6–7. — Foot hills of Trinity Mountains, Nevada, Watson. — Corolla three or four lines long; the broad lobes less than half the length of the ample (yellowish?) throat, at the base of which the stamens are inserted: no narrowed tube. This and the two preceding species are among the discoveries of S. Watson, in C. King's expedition.

++ ++ Corolla fere rotata.

62. G. INCISA, Benth. in DC. Prodr. *G. Lindheimeriana,* Scheele in Linnæa, 21, p. 763. Multiovulata. — East Texas to Mexico.

63. G. GAYANA, Wedd. Chl. And. 2, p. 82. Pauciovulata; "seminibus in loculis 1–2." — Andes of Chili.

+— +— Perennes; floribus majusculis; corolla fere rotata; ovarii loculis pluriovulatis.

64. G. FŒTIDA, Gillies, Benth. l. c. Andes of Chili.

65. G. RIGIDULA, Benth. l. c. *G. glandulosa*, Scheele, l. c. Flowers bright blue, showy, according to Lindheimer opening widely only in direct sunshine late in the afternoon and closing at sunset. — Texas to Arizona and Mexico.

Var. ACEROSA. Rigidior; ramis e basi magis lignosa ad apicem usque crebre foliosis, segmentis foliorum plerisque subulatis vel acerosis subpungentibus; pedicellis flore quandoque brevioribus. North New Mexico to Arizona, Fendler, Gordon, Wright, &c.

4. POLEMONIUM, Tourn.

Corolla ab infundibuliformi ad rotatam. Stamina basim versus corollæ æqualiter inserta: filamenta elongata, sæpissime declinata, basi pl. m. piloso-appendiculata. Ovula in loculis 2 – 12. Semina humefacta tegumento mox mucilaginoso et spirillifero modo *Collomiæ*. Calyx magis quam in *Gilia* herbaceus, sub sinubus vix scarioso-membranaceus, post anthesin accrescens, lobis muticis. — Herbæ perennes rhizomatibus gracilibus, raro annuæ; foliis semel pinnatis vel pinnatipartitis; floribus cæruleis violaceis seu albis.

§ 1. Corolla infundibuliformis calycem superans, tubo sæpius elongato. Filamenta basi vix dilatata tantum hirsutiuscula. — Perennes, nanæ e rhizomate repente, viscido-glandulosæ, moschatæ, foliolis perplurimis minimis confertis. Transitus ad *Giliam*.

1. P. CONFERTUM, Gray, Proc. Acad. Philad. 1863. Spithamæum; foliolis 3 – 5-sectis secus rhachin quasi verticillatis vel fasciculatis, segmentis aut late ovalibus aut lineari-oblongis; floribus (mellium spirantibus) capitato-congestis nutantibus demum racemoso-spicatis; calycis lobis angustis tubo cylindraceo seu oblongo plus dimidio brevioribus; corolla cærulea, tubo angusto-infundibuliformi calycem superante lobis suis rotundatis 2 – 3-plo longiore. — Rocky Mountains from lat. 38° to 49°, Nuttall, Parry, Hall & Harbour, Lyall; E. Humboldt Mountains, Nevada, Watson; and high sierras of California, Brewer. Corolla 9 – 12 lines long.

Var. MELLITUM, Gray, l. c.: laxius; corolla pallida nunc alba pollicari, tubo angusto lobis quaduplo longiore. — Rocky Mountains, Hall & Harbour, &c. Wasatch Mountains, Utah, Watson.

P. VISCOSUM, Nutt. Pl. Gamb. Humilius; foliolis integerrimis ovatis rotundisve; floribus subcorymbosis; calyce subcampanulato, lobis latioribus tubo subæquilongo corollæ tubum (lobis suis haud longiorem) subæquantibus. — Rocky Mountains, about lat. 40°, Nuttall.

Mixed with dwarfed specimens of the preceding, from which Nuttall's character of "elongated-lanceolate segments of the calyx" was probably taken.

§ 2. Corolla inter campanulatam et rotatam, calyce modice longior. Filamenta basi quasi in lamellam dilatata. — Perennes, foliolis integris, superioribus nunc alato-confluentibus, inflorescentia laxiore.

(P. GRANDIFLORUM, Benth., of Mexico, I do not possess, and have barely seen in herb. Kew.)

2. P. CÆRULEUM, L. Common from the arctic regions and Alaska to California and through the Rocky Mountains, also through Northern Asia to Europe; very rare eastward (in New York and New Jersey). — *P. acutiflorum*, Willd., which is reduced by Ledebour to a variety of this species, is an Alaskan form, with ovate acute lobes to the corolla (Pallas, Chamisso, &c.). All the North American, like the Himalayan, forms of this species incline to have wing-angled seeds, — quite as much so as in

Var. FOLIOSISSIMUM (*P. cæruleum*, var. *pterosperma*, Benth. in DC. Prodr.). Valde viscido-pubescens; caulibus bipedalibus usque ad apicem cum ramis floridis corymbosis foliosissimis; foliolis in rhachin alato-marginatam sæpe confluentibus; floribus minoribus; staminibus styloque corolla (calycem 2 – 3-plo superante) sæpius brevioribus. — Through the Rocky Mountain region, Geyer, Fendler, Parry, Vasey, Watson, &c. This approaches

3. P. MEXICANUM, Cerv. (Mexico?) This is distinguished by its shorter corolla, and short lobes of the calyx, which are only half the length of its tube.

4. P. HUMILE, Willd. Spithamæum; caulibus laxis 1 – 2-foliatis; floribus subcorymbosis paucis longius pedicellatis; calyce ultra medium 5-fido; ovulis 2 – 4 seminibusque 1 – 2 in quoque loculo. — *P. pulchellum*, Bunge, Ledeb, &c. *P. Richardsonii*, Graham. *P. capitatum*, Benth., non Esch. *P. pulcherrimum*, Hook., a small-flowered form. — Rocky Mountains to those of California, and through the arctic regions and Alaskan islands to Siberia. — *P. capitatum* of Eschscholtz, from the sands of California, with linear leaflets, &c., cannot be this species, — is probably *Gilia multicaulis*, or some allied species of that genus.

5. P. REPTANS, L. Atlantic States from New York south and west to Nebraska.

§ 3. Corolla (albida) fere rotata, calyce brevior. Filamenta basi sensim dilatata, parcissime piloso-ciliata. — Annuæ, debiles, sparsifloræ ; foliolis integris.

6. P. MICRANTHUM, Benth. l. c. British Columbia to Nevada.

3. *Miscellaneous Botanical Notes and Characters.* By ASA GRAY.

NAMA, L.

The outlines of a monograph of this genus which, in the year 1861, I contributed to the Proceedings of this Academy (vol. 5, pp. 337–339) have long needed some corrections and additions. The following notes for a revision of the genus were mainly drawn up in the Kew Herbarium, in October, 1869.

§ 1. Folia in caulem alato-decurrentia, obovata vel spathulata, pube molli villosa seu pilosa : rami procumbentes.

N. JAMAICENSIS, L. Pedunculi brevissimi. Semina costato-scrobiculata.

N. BIFLORA, Choisy. Pedunculi filiformes. Semina alveolata. — Mexico, collected only by Berlandier.

§ 2. Folia caulina omnia vel plera basi subamplexicauli sessilia, haud decurrentia, pube molli nec incana. Annuæ.

N. BERLANDIERI, n. sp. *N. undulata* var. *macrantha*, Choisy, Hydrol. t. 2, f. 1. Ramis gracillimis diffusis, foliis sparsioribus tenuioribus ovali-oblongis hinc inde oppositis, pedunculis gracilioribus, corolla majore, capsula oblonga sepalis apice magis dilatatis subdimidio breviore, seminibus obsoletius scrobiculatis, diversa. — Tamaulipas, Mexico, near Reynosa, Berlandier (no. 2116 = 699), who alone has met with it.

N. UNDULATA, HBK. Foliis sæpe undulatis omnibus alternis lineari-seu spathulato-oblongis, inferioribus oblanceolato-spathulatis basi longius attenuatis; caule erecto; pedunculis plerumque brevissimis; capsula matura fere lineari calycem subæquante ; seminibus eximie alveolato-reticulatis. — Extends from Texas and New Mexico to the Andes of Chili, Gillies.

§ 3. Folia omnia basi attenuata vel petiolata (nec amplexicaulia nec decurrentia).

* Annuæ, pilis rigidis vel rigidiusculis hirtæ, nec incanæ: folia etiam inferiora basi longius attenuata vix petiolata: sepala anguste exacteque linearia!

N. HISPIDA, Gray, l. c. Semina in loculis 24 – 40, oblonga, haud ultra $\frac{1}{4}$ lin. longa, obsoletissime rugulosa.

N. DEMISSA, n. sp. E radice exili patenti-ramosissima, 2 – 3-policaris, hirsuta; foliis spathulato-linearibus; floribus subsessilibus; seminibus in loculis 10 – 12 ovalibus $\frac{1}{3}$ lin. longis obsolete grossius scrobiculato-rugosis; cæt. fere præcedentis. — Dry or desert regions of Nevada, Fremont, Anderson, Torrey, Watson in King's expedition; forms with ample corolla sometimes twice the length of the calyx. Fort Colville, Washington Territory, Lyall, in herb. Kew.: a very low and condensed form, with corolla not exceeding the calyx: characters indicated by Professor Oliver.

* * Annuæ, pube molliori vel breviori parum cinerea: sepala (ut in pleris) sursum pl. m. dilatata.

+ Folia basi attenuata vel acuta, plera (saltem superiora) sessilia vel subsessilia.

++ Semina haud ultra $\frac{1}{4}$-lineam longa, lato-ovalia, sublævia, obsoletius costata et areolata.

N. SANDWICENSIS, Gray, l. c. Ramosissima, pube crebra hirsutulo-cinerea; foliis brevibus spathulatis margine mox revolutis; pedunculis calyce longioribus vel brevioribus; floribus parvis; corolla calycem parum superante; capsula ovali.

N. COULTERI, n. sp. Laxe ramosissima, spithamæa, hirsutulo-pubescens; foliis oblongo-spathulatis planis membranaceis, imis tantum in petiolum attenuatis; pedunculis calyce brevioribus sæpius brevissimis; corolla calyce duplo longiore; capsula oblonga. — "California" [perhaps Arizona], Coulter, no. 463. Nazas Valley, Bolson de Mapimi, Chihuahua, Mexico, Gregg. It much resembles *N. dichotoma;* but is well distinguished by the more hirsute pubescence without viscidity, the larger corolla (about five lines long), and especially by the seeds.

++ ++ Semina $\frac{1}{3}$ – $\frac{1}{2}$-lineam longa, ovali-oblonga, favosa.

N. DICHOTOMA, Ruiz & Pav.; Gray, l. c. Pube brevi plus minus viscosa, corolla calycem haud vel parum superante, capsula ovato-

seu breviuscule oblonga, seminibus grosse insculptis, distincta. — Mexico to Bolivia. — Var. ANGUSTIFOLIA: foliis lineari-lanceolatis. (Var. *pauciflora*, Choisy?) New Mexico, Fendler, no. 644, also Wright, no. 1584. "Colorado," Hayden. — The seeds in this widely diffused species are well marked, being so coarsely pitted that five or six pits fill the whole girth; and the thick obtuse edges of, or elevated portions between, the pits appear likewise to be minutely rugose under a strong lens.

+− +− Folia omnia graciliter petiolata: semina fere lævia.

N. LATIFOLIA, n. sp. Erecta, laxe ramosa, parce tenuiter hirsutula; foliis membranaceis ovatis obtusis basi sæpius cuneatis (lin. 6 – 9 et petiolo lin. 3 – 5 longis); pedunculis flore parvo longioribus; sepalis apice insigniter dilatatis corollam (albam) adæquantibus capsula brevi-ovoideo longioribus; seminibus globoso-ovoideis, areolis obsoletis. *N.? rupincola*, Mart. & Gal. ex Walp. Repert. 6, p. 565. — Mexico, Oaxaca, in fields and forests of the western Cordilleras, at the altitude of about 8,000 feet, coll. Galeotti, no. 1068. Valley of Mexico, coll. Bourgeau, no. 610.

* * * Perennes? forte annuæ caulibus diffusis basi lignescenti-induratis, pube mollissima: folia parva, cum petiolo brevi semipollicaria vel minora: sepala sursum latiora: semina minima.

N. RUPICOLA, Bonpl. ex Chois. l. c. Depressa, pube brevi vix cinerea; foliis obovatis in petiolum marginatum sensim attenuatis; seminibus subglobosis grosse parceque alveolatis. *N. origanifolia*, Gray, l. c., non HBK. *N. dichotoma* var. *parvifolia*, Torr. Mex. Bound. p. 147. Northern borders of Mexico to Yucatan (Schott) and Peru?

N. ORIGANIFOLIA, HBK. Nov. Gen. & spec. 3, p. 130, t. 218. Cinereo-villosa, subincana; foliis oblongo-spathulatis ovalibusque petiolo distincto; pedunculis sparsis calyce longioribus; seminibus lævibus? .... — Mexico. The principal specimens I have seen (Sierra Madre, Seemann) seem distinct enough from the foregoing, which, however, Kunth's figure too much resembles. He figures, but does not describe, the seeds as smooth.

* * * * Perennes, proceriores basi suffruticosa, foliis floribusque majoribus, pube hispida vel sericeo-canescente. Semina in *N. hirsuta* ut videtur compressa? in cæteris ignota.

+– Mexicanæ; foliis latis penninerviis basi sæpius obtusa distincte petiolatis, floribus in cymula laxa terminali nuda: sepala sursum latiora.

N. HIRSUTA, Martens & Galeotti; Walp. Repert. l. c. Fere hispida; foliis viridibus oblongis; corolla haud ultra semipollicari. — Oaxaca, Galeotti.

N. SERICEA, Willd.: Rœm. & Schutt. Syst. 6, p. 189. Sericea; foliis ovatis seu ovato-lanceolatis subtus incanis; corolla subpollicari. *N. longiflora*, Chois. l. c. t. 2, f. 2. I have it only in the collection of Coulter, no. 914, 915.

+– +– Californicæ, lana araneosa; foliis lanceolatis basi sensim attenuatis vix petiolatis, floribus in glomerulos sessiles axillares et terminales confertis: sepala angusta sursum haud latiora.

N. LOBBII, Gray in Proceed. Am. Acad. 6, p. 37. Sierra Nevada, Lobb, Mrs. Davis, Kellogg.

N. systyla, Gray, l. c., is *Draperia systyla*, Torr. in Proceed. Am. Acad. 7, p. 401.

LYCOPUS, L.

In the last edition of the Manual of Botany, I was induced to consider all the American *Lycopi* with acute-pointed calyx-teeth as forms of *L. Europæus*. Having now had occasion to study them anew, I see grounds for a different opinion, and for disposing our species as follows: —

§ 1. *Stoloniferæ,* — stolonibus filiformibus elongatis apice demum tuberiferis.

* Calycis dentes 4, raro 5, cum bracteis brevissimis obtusi vel obtusiusculi, fructiferi nuculis breviores.

1. L. VIRGINICUS, L. — Forma depauperata: *L. uniflorus* Michx. *L. pumilus* Vahl. — Forma procera, var. MACROPHYLLUS: *L. macrophyllus,* Benth.

* * Calycis dentes 5, acutissimi, nuculis longiores.

+– Bracteæ minimæ: corolla calyce fere duplo longior: stamina rudimentaria brevissima, ovalia seu linguæformia.

L. SESSILIFOLIUS, n. sp. Glaber; caulibus adscendentibus humilibus acutiuscule 4-angulatis; foliis omnibus arcte sessilibus ovatis lan-

ceolato-oblongisve parcius argute serratis; calycis dentibus subulatis rigidis. — *L. Europæus* var. *sessilifolius*, Gray, Man. ed. 5, p. 345. — Pine Barrens of New Jersey, at Atsion, Canby, and Toms River, C. F. Parker, September.

L. RUBELLUS, Mœnch. Suppl. (1802). Subglaber; caule laxo suberecto 1–2-pedali, angulis obtusiusculis; foliis ovato-oblongis seu oblongo-lanceolatis medio argute serratis utrinque attenuatis acuminatis petiolatis; calycis dentibus triangulato-subulatis haud rigidis. — Fresenius in Flora, 1842; Benth. in DC. *L. obtusifolius* Vahl? non Benth.: but if so a depauperate form, and probably not from Hudson's Bay: the indications of habitat in the plants of Michaux's collection are not always correct. *L. Europæus*, var. *integrifolius*, Gray, Man. *L. Arkansanus*, Fresenius, l. c.; a puberulent form, with rather broader and less pointed calyx-teeth, the rudiments of sterile stamens varying from lingulate to linear-spatulate. — Pennsylvania? and Ohio to South Carolina, Louisiana, and Arkansas.

+– +– Bracteæ exteriores acutissimi flores sæpius adæquantes: corolla calycem vix superans: stamina rudimentaria filiformia, apice capitellata vel clavellata.

L. LUCIDUS, Turcz. Caule valido 2–3-pedali erecto superne acutangulo; foliis lanceolatis vel oblongo-lanceolatis (poll. 2–4 longis) acutis vel acuminatis grosse argutissime serratis basi obtusa nunc acuta subsessilibus; calycis dentibus attenuato-subulatis.

Var. AMERICANUS: foliis vix lucidis utrinque sæpius hirtello-puberis; caule plerumque hirsutiori; calycis dentibus minus rigidis. *L. obtusifolius*, Benth. in DC., vix Vahl. — Saskatchawan (Bourgeau, &c.) to Nebraska and Kansas, Fendler, E. Hall. Our plant clearly is not to be separated from the *L. lucidus* of N. E. Asia, which, again, too much resembles *L. australis*, in which also the dots of the leaves are unusually large.

§ 2. *Estolonosæ*, sed rhizomatibus pl. m. repentibus: dentes calycis 5, acutissimi, rigidi, corollam subæquantes, fructiferi nuculis longiores: bracteæ subulatæ, nonnullæ flores adæquantes. Glabræ vel pubescentes, caulibus acute tetragonis, foliis sæpius incisis vel pinnatifidis.

L. SINUATUS, Ell. Caule acutissime tetragono; foliis lanceolatis vel oblongis acuminatis irregulariter incisis et laciniato-pinnatifidis summisve sinuato-dentatis basi attenuatis in petiolum longiusculum; calycis dentibus triangulari-subulatis brevi-cuspidatis; staminibus rudimentariis filiformibus apice capitellatis seu clavellatis. *L. sinuatus, exaltatus,* & *angustifolius,* Ell. *L. vulgaris* & *angustifolius,* Nutt. Gen., sine char. *L. Europæus* (Walt. &c.), var. *sinuatus,* Gray, Man. l. c. — From Canada to Oregon, California, and Florida.

L. Europæus, L. Caule acutiuscule tetragono; foliis latioribus subsessilibus, dentibus lobisve subæqualibus; calycis dentibus subulato-spinulosis; staminibus rudimentariis obsoletis vel nullis. — Collected long ago by Mr. Elias Durand near Norfolk, Virginia, where it was said to abound; recently detected on Petty's Island, near Philadelphia, by C. F. Parker, on waste ballast: adventive from Europe, and probably not established.

SESELI, L.

It is on the whole remarkable that so many of the leading genera of *Umbelliferæ* in the northern parts of the Old World should be without representatives in North America. Some of these gaps may be filled when the botany of our Western regions comes to be more completely investigated; as one appears to be now by the two species of *Seseli* here characterized.

The first of these plants has been for several years known to me in a specimen collected by Nuttall, in flower only, and presented by the kind Mr. Durand. It is ticketed by Nuttall "*Cynomarathrum saxatile,*" but it is not published. The same plant, in fruit only, was gathered by Dr. Parry in 1867, in the mountains of the northeastern part of New Mexico. The second species is no. 221 of Hall and Harbour's collection in the skirts of the Rocky Mountains, in flower only, and therefore not hitherto determined. Dr. George Vasey, in going over the same ground in 1868 at a later season, had the good fortune to obtain specimens in fruit; it is no. 221 of his recently distributed collection.

S. Nuttallii, n. sp. Acaulescens, glabrum; foliis subternato-pinnatipartitis, segmentis linearibus subulato-mucronatis, majoribus dentibus lobisve 1–3 nunc instructis; scapo simplicissimo nudo folia haud superante; floribus ut videtur albis; fructu oblongo glaberrimo pedicello parum longiore dentibus calycis subulatis conspicuis coronato; vittis in pericarpio parum suberoso ad valleculas et hinc inde sub jugis tenuibus; seminis sectione transversa semicirculari subcrenata. — Rocky Mountains, Nuttall. On rocks, Huefano Mountains, New Mexico,

Parry, coll. 1867, no. 83. — A span high, from a thickish branching caudex. Involucre as long as the pedicels, in Nuttall's specimen whitish and as if somewhat petaloid, the leaflets lanceolate or linear and a little connate at the base. Rays of the umbel from three to six lines long, of the umbellets one or two lines long. Styles long. Fruit a line and a half or two lines in length, the jugæ rather salient.

S. Hallii, n. sp. Acaulescens, glabrum; foliis pinnatisectis 3 – 5-jugis, segmentis cuneatis oblongisve incisis vel pinnatifidis, lobis 3 – 7 brevibus mucronatis nunc paucidentatis; scapo simplicissimo nudo folia superante; floribus flavis; fructu anguste oblongo glaberrimo pedicello brevissimo multo longiore; dentibus calycis brevibus demum evanidis; vittis ad valleculas magnis cum accessoriis sæpius in quoque jugo minimis; seminis sectione transversa subquadrata. — Low mountains of Colorado, Hall and Harbour; mentioned in Proceed. Acad. Philad., March, 1863, p. 63, no. 221. Bear Creek, seventeen miles west of Denver, Dr. George Vasey. — Scape ten inches high, slender. Umbel nearly as in the preceding, but the secondary rays are very short, as also are the ovate-subulate leaflets of the involucel. Styles slender. Fruit narrow, two lines long, abrupt both at the base and apex; the vittæ filling the intervals between the narrow and slightly salient jugæ. The odor of the fruit in both species is rather strong. Notwithstanding the yellow flowers of this species and the slender styles in both, they are confidently referred to *Seseli.*

Miscellaneous Specific Characters, &c.

Viola reniFolia, n. sp. Rhizomate floribusque *V. blandæ* vel paullo majore; foliis reniformibus (adultis sæpius poll. 2 latis) utrinque cum petiolo villoso-pubescentibus; scapo pubescente. — This Violet was first brought to my notice by Miss Shattuck of Mount Holyoke Seminary, who collected it at, or received it from, "East Elba, New York." Later Mr. Henry Gillman sent it from Ontonagon, Lake Superior; and now I have fresh specimens and the living plant from Mr. Frank A. Sherman, of Hanover, New Hampshire. Also specimens from the colder parts of Oneida Co., New York, from Professor Paine. It grows in company with *V. blanda,* which it closely resembles as to the flower, but the leaves are more like those of *V. palustris;* yet they are more strictly reniform, and are conspicuously beset with pale, soft and tender, lax hairs.

ABUTILON PALMERI, n. sp. Fruticosum; foliis sinu profundo clauso rotundato-cordatatis denticulatis brevi-acuminatis (nonnullis obsolete trilobis) utrinque albido-velutinis; petiolis ramisque molliter puberulis; pedunculis infimis petiolo longioribus; calyce pedicello capsulaque 8-carpellari molliter villosissimo, carpellis membranaceis 3 – 4-spermis breviter acuminato-rostratis. — Yaqui River, Sonora, Mexico, Dr. E. Palmer. Leaves in the specimens not over two inches in diameter. Corolla orange-yellow, more than an inch in diameter. Seeds in one row, nearly glabrous.

KOSTELETZKYA DIGITATA, n. sp. Minutissime stellulato-pubescens cum stellulis adpressis majoribus; ramis paniculatis; foliis 3 – 5-partitis, petiolo setoso-hispido, segmentis cum foliis simplicibus ramulorum lineari-lanceolatis denticulatis subtus setis triradiatis conspersis; pedunculis unifloris gracilibus; calyce tantum puberulo; capsula 5-carinata ad suturas setosa; seminibus glabris. — Yaqui River, Sonora, Mexico, Dr. E. Palmer, 1869. Corolla little over half an inch in diameter, in the dried specimens purplish with a yellow eye.

DESMODIUM ILLINOENSE, n. sp. *D. canescentem* foliis floribusque, *D. rigidum* racemo et fructu referens; caule erecto 3 – 5-pedali cum foliis pube brevi hirsutulo; foliolis ovatis oblongis seu ovato-lanceolatis obtusis (poll. 2 – 4 longis) subcoriaceis subtus cinereis venis venulisque prominulis eximie reticulatis, inferioribus petiolum subæquantibus; stipulis persistentibus (bracteisque caducis) ovato-lanceolatis sensim acuminatis striatis; racemo simplici; lomento brevissime stipitato vix ultrapollicari ad suturam utramque (infer. profundiorem) sinuato, articulis 3 – 5 ovalibus lineas 3 haud excedentibus. — Illinois, in dry ground, Vasey, Hall, Bebb, Bergen, Stewart, &c.; apparently common, but not yet detected beyond the limits of that State. Smaller specimens have been confounded with *D. rigidum*, and larger, without fruit, with *D. canescens;* but it is abundantly different from both.

ASTRAGALUS ARRECTUS, n. sp. *Oroboidei:* sesquipedalis, cinereopubescens; caule stricto sulcato; foliolis 12 – 15-jugis anguste oblongis retusis supra glabellis subtus pubescentibus; stipulis discretis scariosis; pedunculis elongatis cum spica laxiuscula 3 – 4-pollicaribus; floribus (semipollicaribus) in pedicello brevissimo adscendentibus; calyce campanulato nigricanti-puberulo, dentibus subulatis tubo dimidio brevioribus; corolla ut videtur alba fere recta; legumine arrecto coriaceo oblongo (subpollicari) recto cuspidato basi subito in stipitem calycem subæquantem contracto, ventre leviter carinato, dorso sulco lato profundo, intus bilocellato polyspermo. *A. leucophyllus?* Hook. Lond. Jour. Bot. 6. p. 211, non Torr. & Gray, Fl. — Kooskooskee River, coll. Geyer.

BRICKELLIA ATRACTYLOIDES, n. sp. Fruticosa, ramosissima, vix pedalis; ramulis foliosis puberulis monocephalis; foliis rigidissimis subalternis subsessilibus ovato-lanceolatis spinuloso-acuminatis paucidentatisque 3–5-nervibus, costis cum venis adscendentibus anastomosantibus prominulis, paginis conformibus scabrido-atomiferis; pedunculo 1–2-bracteolato capitulum multiflorum (semipollicare) bis terve excedente; involucri campanulati squamis pauciseriatis, exterioribus ovato- intimis lineari-lanceolatis, omnibus subito acuminatis; acheniis secus costas hirtellis; pappi setis circiter 20 tenuiter saltem inferne barbellulatis. — Utah, near the Rio Colorado, 1870, Dr. E. Palmer. — Leaves less than an inch long, coriaceous and rigid, tapering into a spinulose point and beset with a few rigid spinulose teeth. This species would naturally be associated with *B. spinulosa*, of Northern Mexico, but it has forty or more flowers in the head and a minutely barbellulate or above merely scabrous pappus.

LINOSYRIS SQUAMATA, n. sp. Fruticosa, glabrata, ramosissima; ramulis scopariis viridibus substriatis; foliis squamiformibus brevissimis (lin. 1–2 longis) lato-subulatis triangularibusque subadnatis; capitulis subracemosis vel solitariis ramulos terminantibus plurifloris; involucri squamis oblongis obtusissimis margine subscariosis laxis pauciseriatis et in bracteolas minores decrescentibus; corollæ limbo fere 5-partito tubo dimidio breviore, lobis patentissimis lanceolatis (nervo centrali percursis!); antheris basi subsagittatis; styli ramis appendice brevissimo obtuso superatis; achenio glaberrimo lævi subclavato pappo molli (corollæ tubum adæquante) dimidio breviore.

Var. BREWERI, gracilior, parcius squamata; capitulis paucioribus minus bracteolatis; pappo ut videtur fusco. — Low hills of the Sierra Santa Monica, Los Angeles Co., California, Professor Brewer. I had mistaken this for the male of a Sergiloid *Baccharis.*

Var. PALMERI, crebrius ramosa; squamis loco foliorum approximatis sub capitulis imbricatis involucrum longe bracteolantibus; pappo albo. — Desert of the Colorado, Arizona, 1870. Dr. E. Palmer. — The achenia, which are perfectly fertile, resemble those of a *Baccharis.* The mid-nerve to the lobes of the corolla and the somewhat sagittate base of the anthers are as in *Tetradymia;* the style is of the Asteroideous type. Heads four or five lines long. In Dr. Palmer's fine

specimens the involucre is remarkably imbricate-bracteolated down for the quarter or third of an inch. Corolla bright yellow, its lobes a line and a half long.

Linosyris Sonoriensis, n. sp. Glabra, parum viscidula, ramosissima; ramulis gracillimis; foliis parvis filiformibus apice recurvo nunc fere hamato; capitulis laxe paniculatis; involucro 5 – 8-floro, squamis pauciusculis subcarinatis coriaceis margine scariosis apice obtuso fere herbaceis oblongis, exterioribus brevioribus ovatis; ramis styli appendice ovato-lanceolata obtusiuscula portionem stigmaticum parum excedente superatis; acheniis clavato-oblongis villosis. — District of the Yaqui River, in the Mexican province of Sonora, 1869, Dr. E. Palmer.

20. **Melampodium cupulatum**, n. sp. Hispidulum; caule erecto ramosissimo; foliis (inferioribus ignotis) ramealibus oblongo-lanceolatis integerrimis basi attenuatis vix petiolatis; pedunculis filiformibus subpaniculatis monocephalis; involucro gamophyllo crateriformi ebracteato 5-lobo, lobis lato-ovatis brevibus, squamis int. achenia involventibus rugoso-tuberculatis apice truncatis haud cucullatis clausis; ligulis aureis. — Mexican province of Sonora, Dr. E. Palmer. — Heads about as large as those of *M. cinereum*, DC., but the bright yellow rays smaller: scales of the involucre united to above the middle.

Palafoxia leucophylla, n. sp. *P. lineari* affinis ob corollæ faucem angustam cylindricam tubo proprio lobisque brevibus 2 – 3-plo longiorem; foliis brevibus (semi – subpollicaribus lato-linearibus obtusissimis utrinque canescenti-sericeis; involucro magis pubescente; pappo corolla incarnata subdimidio breviore, paleis 4 majoribus lineari-oblongis costa valida haud excurrente emarginatis, 4 alternis brevioribus spathulato-oblongis costa medio evanida. Achenia extima 2 – 4 pro pappo sæpius paleis paucis brevissimis corneis subconcretis coronata. — Carmen Island, Gulf of California. Involucre half an inch, achenia and corolla each four or five lines in length. The branching stem is said to be about ten feet high, with an indurated, perhaps woody base, and to flower through the season. — Cultivated in the Botanic Garden at Cambridge, it is obviously disposed to become shrubby.

Pentstemon Palmeri, Gray, in Proceed. Am. Acad. 7, p. 378: char. e pl. viva reformatus: Glaucescens, glaber, bipedalis; foliis crassiusculis, inferioribus spathulatis et ovato-lanceolatis argute denticulatis in petiolum marginatum angustatis, superioribus perfoliato-con

natis sæpe integerrimis; panicula multiflora elongata virgata nuda; bracteis omnibus minimis subulatis; pedunculis 1–3-floris pedicellisve gracilibus; sepalis ovatis glabris; corolla albo-rosea (i. e. alba roseo suffusa) pollicari, fauce e tubo proprio brevi (lin. 3 longo) subito maxime ventricoso-ampliata limbo ringente duplo longiore, labiis latis, superiori bilobo, inferiore patentissimo basi intus parce barbato profunde 3-lobo, lobis æqualibus conformibus; filamento sterili ultra faucem exserto apice incurvo insigniter longe flavo-barbato. — Cultivated from seeds of uncertain source, probably from Utah. Corolla almost an inch broad across the spreading lips (anteriorly and posteriorly): lower lip 7–8 lines broad: a light reddish line runs up each lobe of the lower lip.

LYCIUM PALMERI, n. sp. Inerme? subpubescens; ramis gracilibus; foliis angusto-spathulatis (lin. 6–8 longis); floribus breviuscule pedicellatis tetrameris; calycis lobis lanceolatis obtusiusculis tubo suo campanulato parum longioribus, uno saltem paullo majore; corolla (lin. 5 longa) calycem tertia parte superante, lobis late ovalibus pubero-ciliolatis, tubo paullo brevioribus; filamentis ima basi intus lanosissimis; antheris oblongis. — Yaqui River, Sonora, Mexico, Dr. E. Palmer. This apparently belongs to the third section in my revision of the North American *Lycia*, in Proceed. Am. Acad. 6, p. 45. Corolla broad for its length, the expanded limb being about half an inch in diameter.

SALVIA PLATYCHEILA, n. sp. *Brachyanthearum*, aff. *S. laxæ:* herbacea (basi ignota), minutissime cinereo-puberula; foliis oblongis ovatisque utrinque obtusis obsolete crenato-serratis, petiolo tenui, floralibus lanceolatis deciduis; racemo breviusculo; verticillastris paucifloris; calyce puberulo recto; labiis ovatis æqualibus cæruleo tinctis mox ampliatis tubo infundibuliformi nervoso æquilongis, superiore integerrimo, inferiore apice bifido; corollæ cæruleæ tubo incluso; connectivo subcrasso glaberrimo; stylo superne hinc barbato. — Carmen Island, in the Gulf of California, Dr. E. Palmer, 1869. Corolla half an inch long; the upper lip hardly, the dilated lower lip somewhat, exceeding the calyx.

COLDENIA (TIQUILIOPSIS) PALMERI, n. sp.: pube brevi et brevissima densa molli incana; foliis ovatis crebre plicato-nervosis petiolum subæquantibus; calyce tubo corollæ dimidio breviore, lobis lanceolatis tubo ipso breviore. — S. E. California or Arizona, on the lower Colorado, Dr. Edward Palmer, 1869. Well-distinguished from *C. Nuttallii*

by the fine hoariness and the absence of all hispid or even hirsute hairs, and by the calyx. It is apparently more erect and bushy. The corolla is similar but larger, and has roundish-oval lobes. No fruit was collected, by which to learn whether it accords with *Tiquiliopsis* in having two-parted cotyledons. The leaves are more like those of *C. fusca,* but the rib-like veins more numerous and crowded, from four to six pairs, and the surface in the younger specimens strongly and beautifully plicate. This has likewise been collected in Utah or Nevada by S. Watson, in Clarence King's expedition.

ERIOGONUM KELLOGII, n. sp. *Umbellata,* depressum, caudicibus ramisve sterilibus substoloniferis filiformibus late pulvinato-cæspitosum; foliis rosulatis spathulatis parvis (lin. 3 – 4-longis) basi angustata sessilibus sericeo-incanis (supra nunc glabrescentibus); scapo gracili tripollicari medium versus verticillo e foliis 3 – 4 parvis instructo involucro solitario cyathiformi 6 – 7-lobato terminato; perigoniis luteolis demum albidis roseo tinctis extus glaberrimis, stipite gracili, segmentis subconformibus ovalibus obovatisque intus basi cum parte inferiore filamentorum villosis; cotyledonibus late ovalibus excentricis radicula parum longioribus. — In fir-woods, forming tufted mats, Red Mountain, Mendocino County, California, Dr. A. Kellogg, July 1, 1869. Involucre silky-canescent. Perigonium two or in fruit nearly three lines long, not including the stipitiform base of fully half a line. Except that the perigonium is wholly glabrous exteriorly, this neat species would stand next to *E. Douglasii:* but the head and the leaves are smaller, and the flowers fewer: the whorl on the scape usually consists of only three bract-like leaves. The foliage is more like that of a condensed and alpine form of *E. cæspitosum.*

LASTARRIÆA CHILENSIS, Remy. In Proceed. Amer. Acad. 8, p. 199, where this is first recorded as a Californian plant, on the authority of a specimen collected by J. Blake, some doubt was expressed as to whether it was there indigenous. Since then I have been able to ascertain, through the kindness of Mr. Bennett, that a specimen in Nuttall's herbarium, now belonging to the British Museum, ticketed by Nuttall "*Ancistrophyllum Californicum,* Sta. Barbara" is *Lastarriæa Chilensis,* but taller and coarser than any of our Chilian specimens. A slender form of the same species was lately abundantly collected near the mouth of the San Joachin, by Dr. Kellogg, who informs me that it is common around San Francisco, "chiefly, if not entirely, where sheep and cattle frequent." So that its introduction into California by cattle, which is most probable, is not likely to have been recent.

POLYGONUM HARTWRIGHTII, n. sp. *Persicaria, Digyna;* strigoso-hirsutum vel glabellum; caule subpedali erecto striato ad apicem usque crebre æqualiter folioso; foliis lato-lanceolatis utrinque acutis vel obtusiusculis breviter petiolatis; ochreis medio foliigeris hypocraterimorphis, limbo foliaceo brevi reticulato repando setoso-ciliato; pedunculo erecto eglanduloso spicam plerumque solitariam densam cylindraceam gerente; bracteis pedicellos superantibus; perigonio eglanduloso roseo; staminibus 5; stylo profunde bifido. — Sedgy bogs, New York, from Herkimer to Yates County, and Michigan. — Fruit unknown. I collected this almost forty years ago at the head of Cayuga Lake, along with the remarkable *P. amphibium* var. *Muhlenbergii* of Meisner, which is widely distributed in North America. I saw it several years ago, in company with the Rev. Professor Paine, in a high bog near the southern borders of Herkimer County, but not in flower. I have also a well-developed specimen from the State collection in Michigan. Not regarding the stipules, it had been taken for one of the various puzzling terrestrial varieties of *P. amphibium*, or, when the stipules were noticed, for an undeveloped condition of *P. Careyi.* But my attention having been called to it by Dr. S. Hart Wright, of Penn Yan, who finds it in open bottom land, among Carices, at Dundee, Yates Co., New York, I am desirous that it should bear his name, as the real discoverer of its specific characters.

ARGYROTHAMNIA (DITAXIS) ADENOPHORA, n. sp. Herbaceum, molliter puberulum; foliis oblongo-linearibus basi trinervatis subdenticulatis, superioribus cum petiolis bracteis calyceque fœmineo saltem ad margines glandulis claviformibus luteolis obsitis; floribus monoicis; petalis oblongo-lanceolatis integris calycem subsuperantibus, fl. masc. glabris, fl. fœm. extus pilosulis; filamentis columnæ 15 quorum 10 antheriferis; ovario setoso; seminibus obovatis rugoso-foveolatis. — Sonora, Mexico, Dr. E. Palmer.

Appendix: December, 1870.

CONRADINA, Nov. Gen. *Labiatarum.*

Calyx fere *Calaminthæ*, 13-nervius, oblongo-campanulatus, subteres, bilabiatus; labio superiore lato subpatente tridentato; inferiore erecto bipartito, dentibus subulatis longioribus. Corolla exannulata, ad summum tubum angustum rectum calyci subæquilongum retroflexa, profunde bilabiata, ringens; fauce brevi ampliata; labio superiore sub-incurvo retuso; inferiore patentissimo basi contracto trilobo, lobis lateralibus rotundatis, medio latiore emarginato-subbilobo. Stamina 4, inferioribus paullo longioribus didynama, sub labio superiore incurvo-adscendens, fere parallela: antheræ muticæ, biloculares; loculis subparallelis connectivo transversim dilatato demum sejunctis basi fasciculo pilorum instructis. Stylus glaber, cruris subulatis æqualibus. Nuculæ læves, globosæ. — Suffrutex *Rosmarini* facie, ramosissimus, tenuiter canescens, foliosissimus; foliis angusto-linearibus margine revolutis, in axillis nunc fasciculatis; cymulis 2 – 7-floris laxis in axillis subsessilibus; corolla albo-purpurea extus pubescente; calyce fructifero declinato, dentibus (rarius tubo) pilis patentissimis hirsutis.

CONRADINA CANESCENS. *Calamintha canescens*, Torr. & Gray ex Benth. in DC. Prodr. 12, p. 229, & Chapm. Fl. p. 318. — Dry sands along the beach and in pine woods of Western Florida, from Appalachicola to Pensacola and Mobile: called " Wild Rosemary." — A well-marked genus in habit and character, much better distinguished from *Calamintha* than is *Melissa*, in foliage, inflorescence, &c., not unlike *Dicerandra*. The essential character is in the corolla, which is widely ringent, and abruptly bent backwards on its tube.

The genus is dedicated to the memory of Solomon W. Conrad, the associate of Muhlenberg and the other Pennsylvanian botanists of the last generation, the publisher of Muhlenberg's Catalogue and his Descriptio Uberior Graminum, &c., — himself a botanist of no mean acquirements. Long ago the Gerardineous genus which now bears the name of *Macranthera*, Torr., was dedicated to Mr. Conrad by Nuttall (in Jour. Acad. Philad. 7, p. 88); but the earlier-published Gesneriaceous *Conradia* of Martius, in memory of Conrad Gesner, retains this name. By means of a moderate change in the orthography, we may arrange to connect the name of our American *Conrad* with this striking plant of our own country.

POLIOMINTHA, Nov. Gen. *Labiatarum*.

Calyx tubulosus, 13 – 15-nervius, striatus, æqualis, dentibus 5 æqualibus, fauce annulato-villosa. Corolla tubo recto pl. m. exserto, intus piloso-annulato; limbo breviter bilabiato; labio superiore erecto subplano emarginato; inferiore trifido patente, lobo medio emarginato-bilobo. Stamina fertilia 2 (inferiora), parallele adscendentia, apice nunc incurva, antheræ loculis divaricatis: filamenta 2 superiora sterilia brevissima. Styli cruri subinæquales. Nuculæ læves. — Suffrutices incani; foliis integerrimis parvulis; floribus in axillis paucis fasciculatis vel solitariis; corolla ut videtur rosea.

The name, composed of the Greek words for hoary-white, or gray and Mint, is suggested by the silvery canescence. The typical species has been described as a *Hedeoma* by Dr. Torrey, but with a natural misgiving, on account of the habit, the perfectly regular and equally toothed calyx, and the villosity in the throat of the corolla. This forms, indeed, a definite and nearly if not wholly complete ring, which is a character thought to be of some moment in Labiatæ. I am disposed to join with it a species collected by the late Dr. Gregg in Northern Mexico, which has a much elongated corolla in the manner of *Calamintha coccinea*, and which would technically belong to *Keithia* except for the obvious rudiments of the upper pair of stamens, and the pilose ring, which is here close to the base of the tube of the corolla. *Keithia marifolia*, Schauer, in Linnæa, 20, p. 705, from the same region, may probably be added to this genus, at least if no. 1080 of Coulter's Mexican collection is of that species: for in Coulter's plant the rudiments of the upper pair of stamens (of which in Aschenborn's plant there is said to be "*nullum vestigium*") are conspicuous, and even with vestiges of the abortive anther. But no trace of the pilose ring is found.

POLIOMINTHA INCANA. Ramis gracilibus cum foliis linearibus (imisve oblongis) planis obtusis pube brevissima creberrima canescentibus; verticillastris paucifloris; pedicellis brevissimis; calyce breviter tubuloso 15-nervi villosissimo; tubo corollæ parum exserto, fauce ampliata intus piloso-annulata. *Hedeoma incana* Torr. Bot. Mex. Bound. p. 130. — New Mexico, near El Paso, &c., Parry, Wright, Bigelow, Palmer. — Corolla only twice the length of the calyx.

POLIOMINTHA LONGIFLORA, n. sp. Pube molli laxiori; foliis ovalibus vel obovatis (cum petiolo brevi lin. 4 – 6 longis) supra viridulis subtus cano-tomentosis subvenosis; pedunculis in axillis solitariis brevibus unifloris bibracteolatis; calyce elongato (subsemipollicari) vix striato 13-nervi; corolla tubulosa sursum sensim paulloque ampliata longe exserta extus piloso-pubescente, labiis brevibus, annulo prope basim; staminibus styloque exsertis. — Northern part of Mexico (station unknown), Dr. Gregg, 1848 – 1849. — Corolla an inch and a half long.